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WORCESTER'S PINE HILL DAM

A Half-Million Dollar Work Being Done by a City by Day Labor—Sealing the Foundation Rock—Cyclopean Concrete With Expansion Joints—Plant Arranged for Economy.

By ELLIS H. CUSTER.

The water supply of Worcester, Massachusetts, a city of 170,000 inhabitants, is obtained by gravity from impounding reservoirs on four small streams west of the city; there being eight impounding reservoirs in all. This source, however, supplied not quite 13,000,000 gallons of water per day and there have been threatened water shortages during recent years. In view of this and of the rapid growth of the city, provision for increased supply seems to be necessary and the city now has under construction a storage reservoir which will have a capacity of 3,000 million gallons. The construction is being done by the city by day labor and it is expected that three or four years will be required to complete it. The cost is being provided for by appropriations from year to year and will, it is estimated, total \$476,873—a work of greater magnitude than is often undertaken by a city using its own force of laborers.

The intercepting reservoirs on the four streams from

which the supply is drawn are at elevations 300 to 500 feet above the Wachusett reservoir of the (Boston) Metropolitan Water Supply, and ten miles distant from it. One of these streams is tributary to this reservoir. When the state erected this large storage reservoir in the Nashua river valley, requirements of the city of Worcester were of necessity recognized and that city was allowed to reserve for its use several thousand acres known as the Asnebumskit water shed, which, as stated, is tributary to one of the streams supplying the Wachusett reservoir.

In 1911, when the rain-fall up to July had been only 15.19 inches, a water shortage threatened, and a 30-inch emergency pipe line, 7 miles long, was constructed to the Wachusett reservoir, and during the season 62,470,000 gallons were pumped into the Worcester reservoirs, against a head of 550 feet. Again on January 1st, 1915, there was a shortage and 46,800,000 gallons were pumped



FIG. 1.—EXCAVATING SITE OF PINE HILL DAM.

The sand roll is shown at the left background; the storage bins at the right of this. The traveler of the cableway is in the center of the picture.

from the reservoir of the Metropolitan district. It is to prevent the recurrence of shortage and provide for increased consumption that what is known as the Pine hill dam is being constructed, which will almost double the storage capacity of the system. This dam will form a reservoir filling three valleys, to which the jutting hills give the shape of an irregular letter "N." The over-flow level of the reservoir will be 910 feet above sea level. The area of the water surface will be 345.3 acres, and the catchment area draining into it has an area of 4,415 acres. The length of the shore line will be 6.4 miles. This area was acquired by the city by special act of legislature. The topography of this catchment area is such that the run-off is more rapid than in any of the other three streams, hence the large reservoir provided for its storage.

The several reservoirs of the system are at different levels between elevations 718 and 910. As the city is built on seven hills and the different parts vary greatly in elevation, advantage has been taken of this fact to develop a high and low service, using the higher reservoirs for the former and the lower for the latter. The high service is supplied by five impounding reservoirs, having a combined storage capacity of 1,512,943,000 gallons and a water shed of 4,493 acres. This service is used for fire-protection in the centre of the city and for regular service in the hill sections. It gives a pressure of about 145 to 150 lbs. in the business part of the city. This supply is brought to the city in three cast iron pipes of 36-inch, 24-inch and 20-inch diameter respectively. The average pressure in the low-service system is about 80 lbs. This system is

supplied by the other three reservoirs and can also draw from one of the high service reservoirs. The three low-service reservoirs have a combined storage capacity of 1,778,880,000 gallons, and a combined water shed of 9,410 acres. This supply is brought to the city in a 48-inch main.

None of the water is treated in any way. The water sheds are sparsely inhabited and the shores are kept clean by rigid inspection, and drainage of impure water into the reservoirs is prevented by ditching. The water is believed to be quite safe, as is apparently indicated by a very low typhoid rate. The cost of the water works up to the close of the last fiscal year had been \$7,150,425.

The Pine hill dam will be constructed of cyclopean concrete, resting upon a ledge having a northerly dip. A short section on the southerly end and a long section on the northerly end, leaving the ledge and entering the earth surface of the hill on the north, will be of earth with a masonry core wall. The total length of the structure will be 850 feet, and the maximum height will be 120 feet above the rock, at which point the maximum thickness at the base is 80 feet. The width of the top will be 17 feet. The masonry section of the dam is about three hundred and seventy-five feet long and has an elevation at the top of 920, which is that of the earth embankment also. The embankment which forms the remainder of the dam has a core wall, the elevation of the top of which is 915.0. Near the centre of the masonry section is an overflow, the crest of which has an elevation of 910, and a length from end to end of 83 feet which, however, is reduced to a net length of 75 feet by two



FIG. 2.—EXCAVATION FOR PINE HILL DAM.

Grout pipes are shown in the ledge at the right of the derrick. Immediately behind the bull-wheel is an expansion joint with the grooves for interlocking. In one of these, at the right edge of the bull-wheel, is a steel plate water-stop.

4-foot piers of a three-arch bridge, which spans the overflow or spill-way. At the foot of the spill-way will be a pool to receive the overflow, and into this will discharge also the 30-inch blow-off pipe, controlled by a gate.

The masonry dam is divided into ten sections, five of which are 40 feet long and five about 35 feet. These sections are separated by transverse vertical expansion joints. In each vertical expansion joint will be a series of vertical tongues and grooves. The entire joint, when the forms have been removed from it, is covered with asphalt paint to prevent bonding with the next section. About six feet from the up-stream face of the dam is set a plate

of ingot iron to act as a water stop, which plate extends into the sections on both sides of the joint. These cut-offs continue from the bottom to the top of the dam.

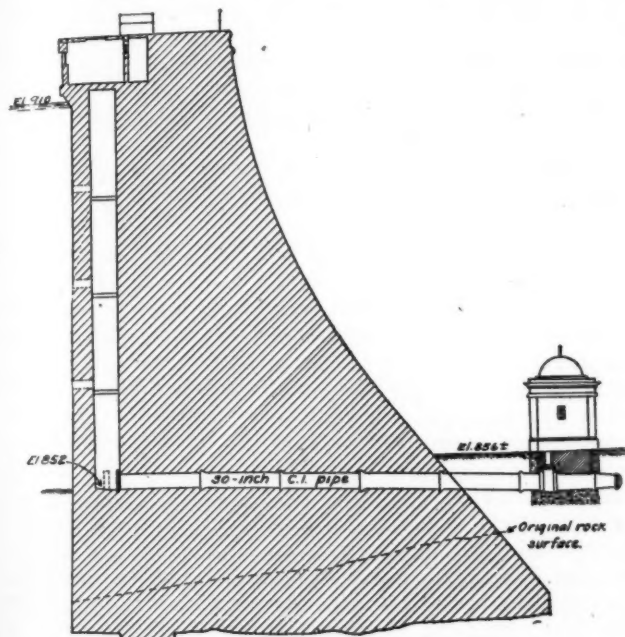
There will be an inspection gallery running lengthwise of the dam at about the level of the reservoir bottom. In order to catch any water which may seep through, the up-stream side of the dam, 6-inch wells will rise, at intervals of 20 feet measured longitudinally, from the top of the inspection gallery almost to the level of the spill-way. Any water entering through these wells, or otherwise reaching the inspection gallery, will be drained to the pool below the dam.

The estimated quantities include approximately 35,000 cubic yards of excavation, 70,000 cubic yards of earth fill and 50,000 cubic yards of concrete masonry. The dam was designed by city engineer Frederick A. McClure.

Preliminary wash borings were made, but these indicated that the ledge lay higher than was shown to be the case by later borings made with a well drill and by subsequent excavations. The wash borings were made by driving down a 2½-inch pipe with a hand sledge (extending it by 3-foot lengths as it sank), the earth being washed out by a chisel point attached to a 1-inch core pipe through which water was discharged. Later, 6-inch holes were sunk by a steam well driller, which was brought in by railway and lowered to the stream bed by cable. The plans for the dam were not completed until after these borings had been made.

Rock outcrops on the hill at the south end of the dam, but dips under the surface and is covered with forty feet of earth at the bed of the stream. The soil is largely diatomized earth, which is water tight, but excavations in it require sheeting.

Before excavating the dam site, provision was made for carrying the stream around it in a channel built on the side of the hill lying north of the valley. It is expected that, by the end of 1916, the discharge pipe through the dam will be in position, which pipe will carry



SECTION OF DAM AT GATE CHAMBER.

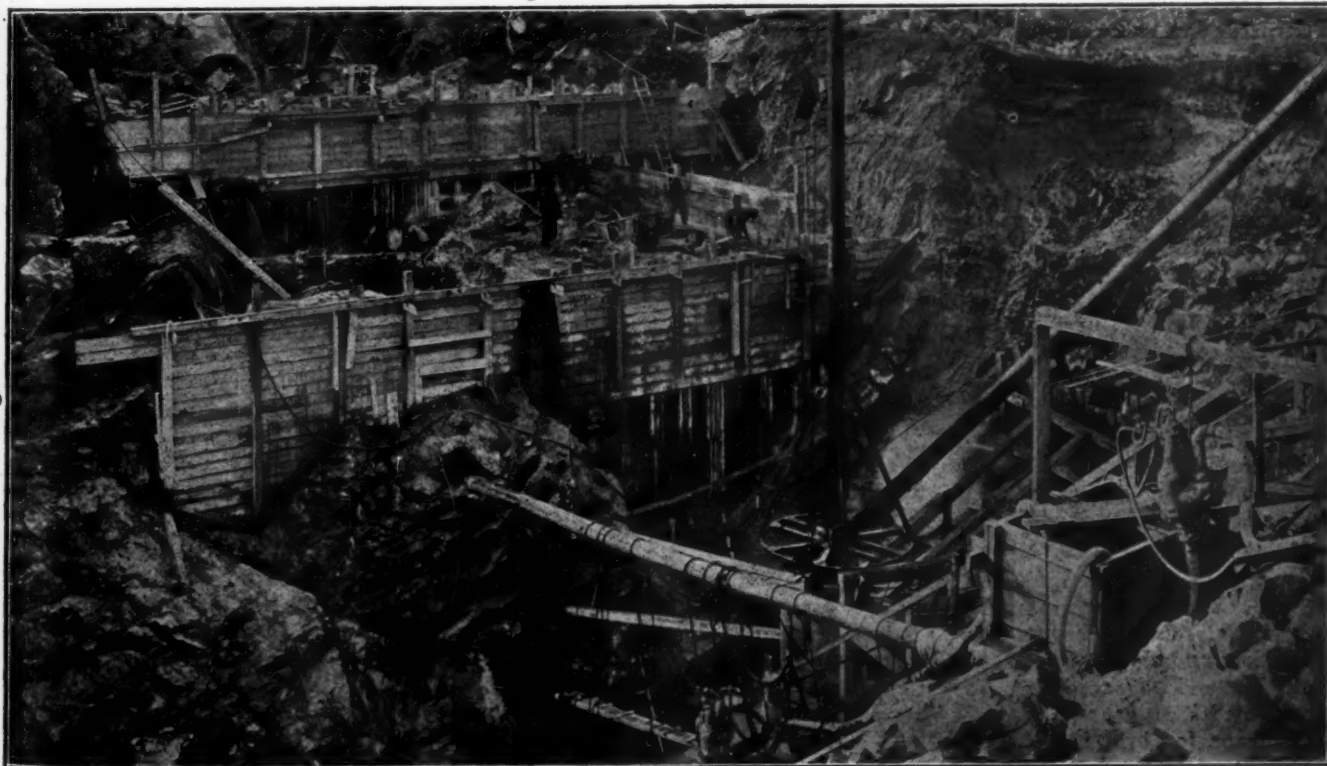


FIG. 3.—SAME VIEW AS FIG. 2, SHOWING FORMS FOR NEXT COURSE OF CONCRETE.
In the foreground, steam pumps slung from detached derrick boom.

the stream, except during spring freshets, when the surplus water can pass through the dam, a section immediately above the stream being left lower than the remainder of the construction for this purpose.

City workmen were engaged on the clearing of the reservoir site and excavation of the same until August of this year, when the first concrete was poured into the foundation of the dam. After the excavation for the dam had been completed, the underlying ledge was drilled and tested for soundness and general suitability. The rock proved to be quite dense, but has been treated with great care to prevent any seepage under the dam. For removing the rock at the surface, blasting was resorted to, but only light charges were used. Toward the bottom of the excavation, however, the rock was loosened and removed with bullpoints and picks, without the use of powder.

In order to further seal the sub-foundation, holes were drilled to a depth of 25 to 30 feet and 2-inch pipe inserted in the top of each hole and a tight joint with the rock made by calking with lead, and cement grout was forced into the drill hole under 90 lbs. pressure; the object being to fill any slight seams or crevices in the rock. Under this treatment none of the drill holes took more than a barrel or two of cement. For forcing the grout into the holes a Ransom-Banniffe grouting machine was used. These lines of holes were drilled about six feet apart, and others where the condition of the rock indicated the necessity. Ingersoll-Rand drills were used in this work. Possibly no such extreme precaution would have been taken had the city not had a previous experience in the case of the Kendall dam. Leakage from fissures in the ledge had been found occurring at some distance from that dam and these fissures were treated by drill and grouting as just described. Into one of these drill holes some eighty barrels of cement in the form of grout was pumped.

For constructing the concrete, rock for the broken stone is found locally in abundance; but, what is rather unusual in that locality, there is no sand of suitable character within economical reach. To supply this deficiency the constructor is making his fine aggregate by crushing the stone in a sand-roll. This sand-roll is in a frame tower adjoining the stone-crusher. Stone which is passed through a one-inch mesh is delivered onto a belt-conveyor, and by this delivered to the sand-roll. The crushed stone from the sand-roll which will not pass a $\frac{3}{8}$ -inch mesh is returned automatically for a second trip through the rolls. The fine aggregate thus secured has a sharpness which is considered desirable for the concrete work. The cost of this fine aggregate is estimated to be less than \$1.00 a yard, which is lower than the market price for sand.

The crusher and sand-roll plant, and also the Lidgerwood cable-way which is used, are operated by steam from Stewart horizontal boilers. Wood is used for fuel in these boilers, that which was cut in clearing the reservoir site being used, and brought to the boilers on a switch-back track. Conveniently arranged along a spur track are low buildings used as machine shop, carpenter shop, oil house, etc., neatly labelled with these designations.

The constructor's plant also includes a cableway, steam derricks, air compressor, buildings for various purposes, storage for broken stone, sand and cement, and a system of railways reaching by switch-backs to most parts of the work. The railway continues to a road a mile distant, from which it transports tools and materials and is the only means for bringing these and the laborers to the work. Two Porter locomotives are used on this railway. Stone is brought from the quarry ledges on the hill above in stone cars, which are run down by gravity to the elevator of the crusher.

As far as possible gravity is employed for the economical operation of the work. The oil house has storage room for twenty barrels, which are discharged from the cars down a gravity skid into the storehouse. A water tower is located well up on the hill-side and furnishes water for all purposes.

All hard rock removed in excavating has been stored on the hillside under the cable, much of it being 3 to 4 cubic feet in size and some as large as a cubic yard. When it is purposed to set these in the concrete as "plums," holes are drilled in the top in which are set iron dogs by which to lift them. After being lifted, each stone is lowered onto a water-tight flanged table, where it is washed by water under pressure to remove any dirt and loose particles and give it a perfectly clean face for bonding with the concrete. The water used for washing is drained to a 2-inch pipe by which it is carried away from the foundation excavation.

The concrete is mixed 1 cement, 3 sand, 1 pea stone, and 6 broken stone; or the pea stone may be omitted. As pea stone is one of the products of the sand roll and crusher, the former mixture (which was determined by special analysis for this dam) is used for most of the work.

Concrete mixing is carried on at the southerly edge of the excavation, the highest surface elevation of the dam site. Here are two Smith mixers. Cement, stone and fine aggregate are brought to the mixing platform in narrow-gauge side-dump cars. Two methods are employed for transporting concrete from the mixer into the excavation. No chuting is employed, as it is believed that denser concrete can be obtained by not using this method. The concrete is discharged from the mixer into a bucket of half cubic yard capacity resting on a flat car below the spout. The car is either run under the cable, by which it can be picked up; or it is let down an inclined industrial track laid along the down-stream slope of the excavation, a Dake engine and cable being used for this purpose.

Irregular sections of stone and mortar walls are laid out for the benches that are constructed in the Cyclopean masonry in the wide cross section at the base of the dam. Effort is made to build these in 4-foot or 5-foot lifts, but where they can not be of that height, they are made at least 30 inches high. These walled sections are purposely kept from being uniform or regularly placed in order to avoid weakening joints in the masonry. Each of these lifts is filled with concrete at one continuous pouring, in which the plums are embedded. This plan was adopted to allow for variations in speed of the concrete crew, which may be caused by the sand supply or labor, conditions relative to either of which might make uncertain the completion of a section entirely across the dam at one pouring. A gravity concrete mixer is about to be put into operation in order to hasten the concreting. It will be set up in the first instance about halfway down the dip of the ledge, where it will be supplied with aggregates by a car let down on the industrial track by the engine and cable. Another car running on a continuation of this track will take the concrete from the bottom hopper by gravity to the place of pouring.

Work will be continued this winter on the hill on the north side of the valley. It was maintained last winter, although there were three or four feet of snow on the hillside much of the time. A snow plow was kept in operation to keep the tracks clear.

At first only employees taken from the city's civil service list were used in this work; but the labor scarcity of the present season necessitated the suspension of this rule. At present there are 90 to 100 workmen employed on the dam, although it was expected to keep 125 continuously at work. Labor is paid an average of \$2.50 per day.

DESIGNING STORM WATER INLETS

Calculating Width of Chamber So That Water Will Not Strike Rear Wall—Ease of Cleaning Provided For.

BY HARRY F. HARRIS, ASSOC. M. AM. SOC. C. E.*

It is with much interest that the writer has read the articles and correspondence recently published in the Municipal Journal relating to both the design, construction and location of storm water inlets, or as they are sometimes termed, "catch basins." In his judgment it is well to draw attention to this particular part of the design of sewerage and drainage systems, since so little real study has been given to it. Usually the questions of both the type and location of inlets are considered as mere matters of detail and looked upon as only incidental.

The design of inlets seems to have been left in the past entirely to some foundry man or to some one other than an expert who has had intimate knowledge of just what the exact duty was which the inlet had to perform. In other words the true function of the inlet seems to have been overlooked in the majority of designs.

So far as known to the writer, the first attempt to design an inlet along rational and scientific lines was made in the city of Trenton about three years ago.

Various types and styles of inlets had been used for years with a greater or less degree of success, the chief difficulty being in intercepting and carrying off the water before it had time to accumulate. Many instances were on record where the discharge was computed and pipes laid having the required capacities but for some reason or another the water did not seem to be carried away at the point of entrance with the desired rapidity. This condition set in motion the mental machinery of Alfred C. Gregory, engineer of sewers and water of the city of Trenton, and as a result he has evolved an inlet which the writer believes is a great improvement over the numerous styles of inlets now in general use. This inlet is of very simple design, pleasing appearance, easily constructed, extremely practical, is of reinforced concrete and takes care of the water in ideal fashion. In addition, it can be cleaned with facility. Mr. Gregory decided to experiment, and began some investigations which were carried out along such lines as would determine the actual curves assumed by water falling various distances at given velocities with an assumed head of 0.5 of a foot. It is obvious that if, in a given inlet, the horizontal distance from the curb line to the back wall of the inlet is not sufficient to allow the water to reach the bottom of the inlet or point of discharge, the velocity of the water will be retarded considerably by reason of its constant

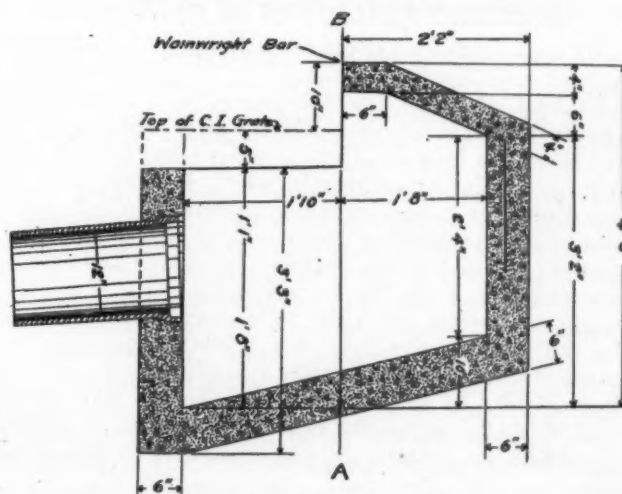
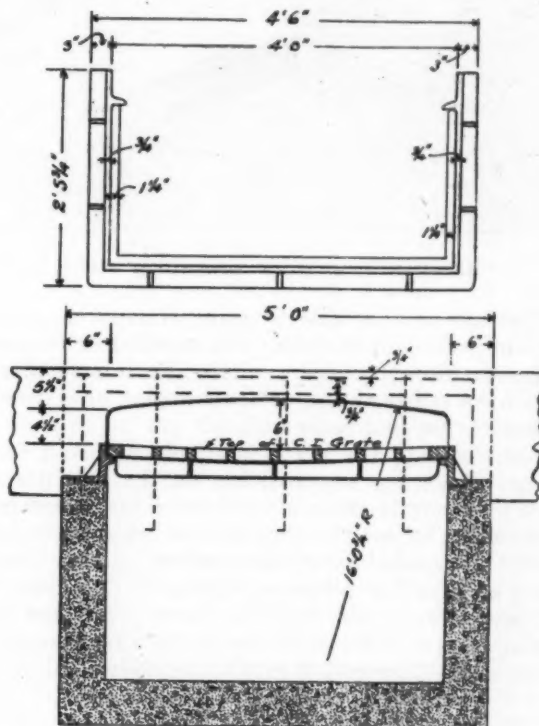
impact against the back wall of the inlet. The greater the distance from the bottom of inlet to the point of contact, the greater will be the reduction in discharge. This is especially true if the water is discharging under a head of 6 or 8 inches. It is then necessary that this distance be great enough to allow the water to pass freely from the opening directly to the base of the inlet.

In order to determine approximately what this distance should be, he computed and plotted several curves, the first assuming an initial velocity of two feet per second, another at four feet per second, and still another at six feet per second, each falling a distance of three feet, and with a depth of six inches. In computing these curves he used the equation for a particle projected horizontally,

$$Y = \frac{g x^2}{2 V^2} \text{ where } g = 32.2 \text{ and } V \text{ is the}$$

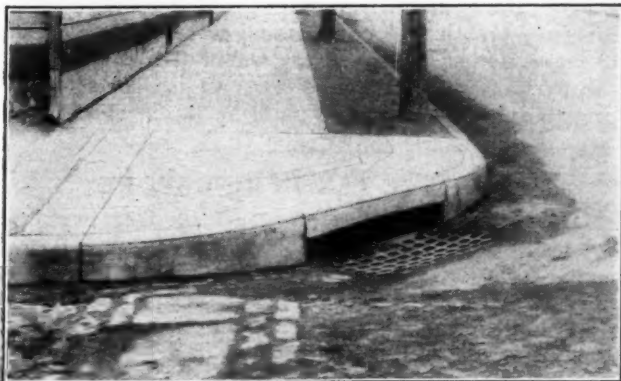
initial velocity at point of entrance.

After these calculations had been made, the back wall



TRENTON INLET DETAILS.

Top—Plan of frame for holding grate.
Middle—Section on line A-B.
Bottom—Section at right angles to curb.



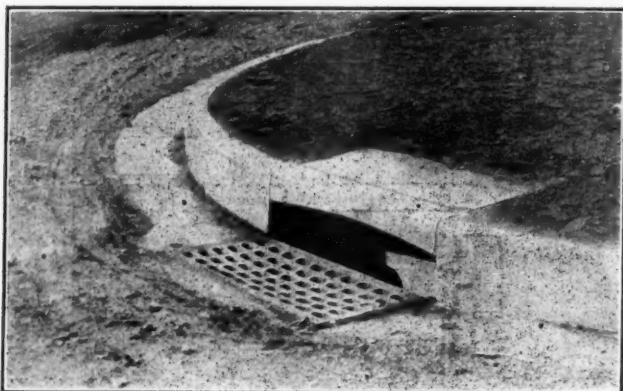
TRENTON INLET AT PAVED CORNER.

*Assistant Engineer of Streets, Trenton, N. J.

distance of the various inlets then in use were plotted and compared with the curves to ascertain whether or not they were anywhere near adequate in this respect. It was found in every case that the distance was insufficient.

Preparation was immediately made to design a reinforced concrete inlet which would meet all the required conditions. Of the three curves tried out as mentioned above, the one assuming an initial velocity of four feet per second was selected as being nearly representative of the local condition.

The resulting structure is shown in detail in the reproduction of the drawings and photographs.



TRENTON INLET ON UNPAVED PARKWAY.

The inlet is adaptable to many conditions. It can be used in parks and suburban communities or in congested sections; also at corners where the intersecting street lines form either obtuse or acute angles, or if desired can be used in the middle of a block.

For cleaning, the grate is simply removed from the frame, which has no cross-bar on the side nearest the curb line, nor is there a bar across the opening in the curb, which allows the workmen so much more freedom.

For all-around utility the writer believes that these inlets surpass any other yet devised. This type of inlet has now been in use here for three years, one hundred having been used on one contract for a large storm water drain, and all are giving excellent satisfaction.

ASSESSING BUILDINGS IN CLEVELAND.

By a plan put into effect recently by John A. Zangerie, auditor of Cuyahoga county, all buildings erected in Cleveland, O., with few exceptions, are listed on the county tax duplicate immediately after building permits for them are issued. The exceptions are factory buildings or similar structures in which it is apparent that machinery or other taxable equipment which is not shown on the building plans will be placed upon completion. In such cases, notations are made and assessors are sent later to make the appraisals.

The appraisals are made by an expert appraiser paid by the county, who each day takes the permits issued the day before, figures out the valuations and sends them immediately to the county courthouse. It is claimed that this plan saves the time and expense of assessors and offers no opening for any structures to escape taxation.

For performing this work, tables have been compiled by the county. Generally the valuation is arrived at by taking the square foot area of the building as a basis. For warehouses and structures without floors, the area of the side walls and roofs is taken. Heavy construc-

tion, elevators, sprinkler systems, plastered ceilings, partitions, ornamentation, and plumbing are added separately. Several of the rates as contained in the appraiser's book of instructions are as follows:

For store buildings, cheaper office buildings, banks, halls, churches and theatres, reinforced concrete construction, full basement, flat roof, steam heat, sinks and water closets, pressed brick front, nine foot basement, eleven foot first story, ten foot upper stories; assessment rate per square foot of ground floor area, one story, \$250; 2 stories, \$470; 3 stories, \$640; 4 stories, \$810; 5 stories, \$980. Add for gable roof 20 cents per square foot of building area; for elevators, \$150 to \$200 per floor; for sprinkler systems, 10 cents per square foot per floor; for extra height of ceilings, 10 cents to \$1.00 per square foot per floor.

Brick walls, not plastered, in stores and warehouses are assessed at 22 cents per square foot if 8 inches thick, 33 cents if 12 inches thick, and 44 cents if 16 inches thick. Four-inch cement floors at 10 cents a square foot. Single wood floors at 15 cents and double wood floors at 19 cents. Steel ceilings are assessed at 7 cents to 12 cents a square foot. Plastered partitions, two sides, wooden lath, 10½ cents per square foot; and 15½ cents if of metal lath. Plastering alone on wood lath, 35 cents a square yard, on metal lath, 60 cents to 70 cents a square yard.

Boilers generally are estimated at \$10 to \$20 per horse power, with \$4 per horse power additional for stoker attachments. Steel oil tanks are appraised at 60 cents per barrel capacity. A ten-ton capacity crane is estimated at \$3,500 and a twenty-ton crane at \$5,000 to \$5,500. Wooden trestles are considered worth \$15 to \$20 a lineal foot and steel trestles \$24 to \$30.

AN ORGANIZATION OF WATER EMPLOYEES.

Portland, Maine, has an organization of city employees which we believe to be unique, which has adopted the name of "The Water Meters." The organization is composed of employees of the Portland water district and its purpose is indicated by the topics discussed in a meeting held December 1st. These topics were: "How can the water district best dispose of its surplus water for profit?" "Description of the blow-off at Fox and Anderson Streets." "Assume that the 42-inch main has been carried away by high water at Little River crossing; describe roads to be taken by automobile to nearest point to reach gates, blow-off and air valves." "Proper way to shut off to make necessary repairs, and to refill main after repairs." "Assume the 20-inch main to be broken at Main and Bridge streets, Westbrook. Describe what gates would be closed and other operations necessary to make repairs and restore service."

From the above it is apparent that this organization is intensely practical in its aims and services, the idea being to make the employees of the water district proficient in the performance of their duties. It is also a school in preparedness and seems to us to be an excellent idea.

WHEEL TAX IN SINGAPORE.

Of a municipal budget for 1917 of over two million dollars in Singapore, India, about one-fourth will be collected from taxes and licenses on carriages, horses, carts, dogs, drivers' fees, etc. Special taxes are levied on traction engines, carts, motor cars, jinrickshas, bicycles, tricycles, horses, mules, etc., varying from \$1.15 on bicycles and tricycles, and \$2.85 for horses and mules, to \$6.80 for carriages, \$13.60 and \$28.40 for small and large motor cars, and \$57 for motor trucks.

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Contributed Articles and Reports.

Contributions suitable for this paper, either in the form of special articles or as letters discussing municipal matters, are invited and paid for.

City officials and civic organizations are particularly requested to send Municipal Journal regularly their annual and special reports.

Information Bureau.

Municipal Journal's Information Bureau, developed by twenty-one years' research and practical experience in its special field, is at the command of our subscribers at all times and without charge.

THE VALUE OF PRELIMINARY ROAD PLANS.

Those not familiar with road work too often undervalue the importance of having an engineer, or some other person experienced in road matters, make preliminary plans of a proposed road and an estimate of the cost of the same, and of delaying making any appropriation or taking other action until such plans have been made. This is illustrated by an instance brought to our attention by the American Highway Association. According to the information furnished us, the Massachusetts Legislature some time ago, desiring to have a new road built on Cape Cod, made a guess of the cost of such road without consulting the State Highway Commission, and appropriated \$14,000 for building the road. Fortunately, before final action the Highway Commission was requested to make an estimate of the cost of building this 2½-mile road through an unsettled part of the scrub-oak district, but to do it immediately, without taking the time to send anyone onto the ground to even locate a route. The United States Geological Survey had quite thoroughly mapped Cape Cod some years previous, so that the general topography was available. The Highway Commission had been building roads on the Cape for ten years, and its engineers were familiar with general conditions there. Using the information available from these sources, the commission estimated the cost at \$22,000. Later, when time permitted, a survey was made and it was found that a road built on the route that the commission had laid down on the topographical map would cost \$36,000. The engineers, however, found that another route was available, the advantages of which were not apparent from the topographical map, but which would cost \$9,000 less to build.

The moral of this would seem to be apparent. The

laymen, without the assistance of the engineer, guessed within 61 per cent of the actual cost. The engineer, without being permitted to make a special examination of the problem, was able to guess within 39 per cent. When permitted to make a proper study of it, he was able to arrive at approximately the true cost and moreover, what is even more important, was able to reduce the cost by 25 per cent by planning a more economical location.

In concluding the story, the Highway Association makes the following comment: "What would have been the result had construction been started as soon as the legislature appropriation was available? It would have been impossible to complete the road, and travelers over the completed section would have been led to an almost impassable trail through loose sand and scrub oak barren. Everybody connected with the undertaking, except the legislature that was really at fault, would have been blamed for their poor management of the work, and sensible road building would have become a subject of local derision."

A. S. M. I. SPECIFICATIONS.

During the several years the American Society of Municipal Improvements has been engaged in preparing standard specifications for city paving and sewers, the society and the several specification committees have annually requested that the specifications already recommended by the society be carefully studied by all interested parties, and that they send to the several specification committees any suggestions or information bearing upon changes which it would seem to be desirable to make at the next convention; requesting that this matter be submitted to them at least a month or two before the convention, so as to give time for its consideration. In addition, the committees have held a public meeting on the day preceding each convention at which to listen to suggestions and arguments with reference to proposed changes in the specifications.

What has happened every year has been that no one has communicated with the committees on the subject previous to the public meeting held the day before the convention, with the result that there has been much justified complaint that specifications have been adopted and changed without proper consideration. It is difficult to see, however, how the committees themselves are to blame, unless it may be claimed that they should have refused to recommend any changes whatever because of the insufficient time given them for thorough consideration.

In order to make a more decided effort to induce all interested parties to bring any changes which they have in mind to the attention of the committees well in advance of the convention, the executive committee of the society is considering a proposed ruling that: (1) All matters regarding specifications must be taken up with the respective sub-committees as early as possible. (2) The sub-committees shall forward their reports to the secretary of the society at least six weeks prior to the convention and they shall be published and distributed to the members with the advance papers. (3) No changes in specifications that have not been taken up with the proper sub-committees in accordance with (1) will be considered at the convention by the general committee on standard specifications, or by the convention.

If carried, this will mean that no change can be made in the specifications of the society which has not been submitted to all members of the society in printed form at least two or three weeks before the convention. There is, of course, the danger than an excellent idea and one which the committee might be glad to adopt might be

suggested later than the time limit set by this rule; but this danger would seem to be much less than that of the hasty action which has prevailed in the past. In our opinion, the rule is an excellent one to adopt, for trial at least, and it is to be hoped that the executive committee will adopt it.

SNOW REMOVAL AND LABOR SHORTAGE.

The problem of removing snow from New York's streets is giving concern to street cleaning commissioner Fetherston, in view of the fact that the number of men who have expressed their willingness to answer calls for emergency work in removing snow is less than one-fourth of the number on the department's books a year ago. In view of this, the Commissioner has announced his intention of requesting the citizens the coming winter to clean not only their sidewalks, but also a part of the roadway in front of their property whenever a snowfall of unusual depth may demand this as an emergency measure.

Municipal Journal has taken occasion two or three times in the past to express its opinion that it is as much the duty of the city to clean the sidewalks as to clean the roadway, since one is as much a public thoroughfare as the other, and in the majority of cases the dirt upon one is as much a result of public use as that upon the other. In this connection we suggested that, while the cleaning of light snows is performed by some cities on the principle that the cleaning of them was as much a municipal function as the cleaning of the roadways, we also suggested that a heavy snowstorm presented an emergency which could not be met promptly by the ordinary force of the city, and that under such conditions the city was warranted in calling upon the private citizens as an emergency measure to clean the sidewalk portion of the public thoroughfare which lay in front of their own property. The same line of reasoning would support the idea of Mr. Fetherston, that this emergency duty need not necessarily be confined to the sidewalk but might extend to a part or even to the whole of the roadway.

In speaking of this proposed plan, commissioner Fetherston has said: "It must be realized that the measure will not be a heavy burden, as some think, because the citizens will be called upon for help only in case of great emergency. It must also be understood that the police, who are responsible for the traffic, rather than the Street Cleaning Department, will decide when such an emergency exists. They are the best judges of it. We are not asking residents to do our work, but only to help us to keep their own streets open for traffic."

Whether the citizens take kindly to this or not, it appears to be probable that, if there should be any large snowfalls this winter, either the citizens will respond to this call or some of the streets will remain unclean for several weeks. What this delay in removal of snow means to the trucking business and to the street railways and other forms of street traffic, is partially realized by citizens who have experienced the congestions caused by snow in previous years, when several times as much labor was available for removing it as can probably be secured by the department during the coming winter.

BRITISH CITY SAVES WASTE PAPER.

On account of the shortage of paper, the saving of waste paper is now being carried on extensively and thoroughly in Bradford, England. At the Bradford town hall, previous to the war, tons of waste paper had annually to be disposed of at a cost of approximately \$7.50 per ton; but it is now being sold at prices ranging from \$15 to \$60 per ton, according to the grade.

SNOW REMOVAL FROM SIDEWALKS

Ordinances Concerning This Matter in New York, Detroit, Buffalo, Milwaukee, Newark, Providence, Columbus, Grand Rapids, and Montreal.

By A. L. BOSTWICK.*

Municipal ordinances relating to the removal of snow from sidewalks take several different forms. It is believed that the compilation below covers the subject fairly well:

New York (Ordinance approved July 16, 1915).

The following regulations are in effect in New York:

"Every owner, lessee, tenant, occupant, or other person having charge of any building or lot of ground in the city, abutting upon any street or public place where the sidewalk is paved, shall, within 4 hours after the snow ceases to fall, or after the deposit of any dirt or other material upon said sidewalk, remove the snow, and ice, dirt or other material from the sidewalk and gutter, the time between 9 p. m. and 7 a. m. not being included in the above period of four hours; provided, however, that such removal shall in all cases be made before the removal of snow and ice from the roadway by the commissioner of street cleaning, or by the borough president of Queens or Richmond, or subject to the regulations of said commissioner of street cleaning, or of said borough president of Queens or Richmond, for the removal of snow and ice, dirt and other material; except that in the boroughs of Queens and Richmond any owner, lessee, tenant or occupant or other person who has charge of any ground abutting upon any paved street or public place, for a linear distance of 500 feet or more, shall be considered to have complied with this section, if such person shall have begun to remove the snow and ice from the sidewalk and gutter before the expiration of the said 4 hours, and shall continue and complete such removal within a reasonable time.

Whenever any owner, lessee, tenant, occupant or other person having charge of any building or lot of ground abutting upon any street or public place where the sidewalk is paved shall fail to comply with the provision of any ordinance of the City for the removal of snow and ice, dirt, or other material from the sidewalk and gutter in the street, on the side of the street on which such building or lot abuts, the President of the Borough in which such building or vacant lot is located may cause such removal to be made, meeting the expense thereof from any suitable street cleaning or highway fund, and thereafter the expense of such removal as to each particular lot of ground shall be ascertained and certified by the said Borough President to the Comptroller, and the Board of Estimate and Apportionment may authorize such additional expenditures as may be required for the said removal of such ice and snow, dirt or other materials, to be repaid to the fund from which the payments were made, with proceeds from the issue and sale of revenue bonds which shall be sold by the Comptroller, as provided by law.

The said Borough President shall, as soon as possible, after the work is done, certify to the Corporation Counsel the amount of the expense chargeable against each piece of property.

The corporation Counsel is hereby directed and authorized to sue for and recover the amount of this expense, together with three (3) dollars penalty for each offense, and when so recovered the amount shall be turned over to the City Chamberlain to be deposited to the credit of general fund of the City of New York for the reduction of taxation."

The Commissioner of Street Cleaning has gone on record to the effect that the ordinance has been difficult to enforce. He recommends that violation be made an offense punishable by fine or imprisonment.

Detroit (1912 code, chapter 54, section 1).

Owners and occupants of property must have snow and ice removed from sidewalks within 24 hours after such snow or ice has fallen or formed. In the case of ice, saw-dust, salt, sand or ashes may be used to make the sidewalk safe for pedestrians. In cases of violation, the Department of Public Works serves notice, and if

*Municipal Reference Librarian, St. Louis Pub. Library.

the ordinance is not complied with within 24 hours, the work is done by this department and the expense is assessed against the property in the same manner as in proceedings for repair of sidewalks, or a bill is rendered by the department direct to the owner.

Buffalo (1912 code, ch. IV., sections 14-15).

Occupants or owners must have snow and ice removed from sidewalks before 9 a. m. In the case of sidewalks that are not paved, it is necessary only to clean them for a width of 3 feet. In the case of matter that is frozen hard it is permissible to render the sidewalk safe by sprinkling ashes, saw-dust, etc., thereon. In cases of violation a fine of not less than \$5.00 is imposed. In such cases the Superintendent of Streets may employ men to do the work at a price not to exceed 25 cents per hour, and upon order of the Common Council the expense thereof is assessed against the property.

Milwaukee (1914 code, section 1290).

Snow and ice must be removed by owners or occupants by noon of each day. With reference to snow and ice frozen hard, the same provisions prevail as in Buffalo. There is a penalty of from \$1.00 to \$5.00 for each day of violation.

Newark (1913 code, section 774).

The owner or owners, occupant or occupants, person or persons having charge of each and every dwelling house, store or other building, or lot or lots of ground, and in cases where a building is occupied solely or partially as a dwelling house by one or more families, then the occupant or occupants of the first floor, and the occupant or occupants of the second floor as to the balance of the sidewalk and gutter, shall within the first five hours after each fall of snow or hail, or after the formation of any ice upon the sidewalks or in the gutters, cause the same to be removed entirely from off the sidewalks, and to the breadth of not less than one foot out of the gutter, opposite the entire frontage of such dwelling house, store, building, lot or land, or opposite such part of said building, as aforesaid, under the penalty of five dollars for every such neglect, to be forfeited and paid by such owners or owner, occupant or occupants, person or persons having charge or control of such premises, as aforesaid, severally and respectively.

Providence (1914 code, ch. 30, sections 24-25).

Snow must be cleared from sidewalks within the first 4 hours of daylight after snowfall has ceased. Each hour of violation entails a penalty of not exceeding \$20.00 fine. Ice must either be removed or covered with sand, etc.

Columbus, O. (Ordinance 22,711, approved March 20, 1906).

Every owner, occupant, or person having charge of any tenement, building, lot or land, fronting on any avenue, street, alley or public highway of said city, shall clear the whole sidewalk in front of said tenement, building, lot or land, of snow and ice before 10 o'clock of the forenoon of each day; provided that if the sidewalk in front of said tenement, building, lot or land is not paved, a pathway thereon shall be cleared of snow and ice to the width of at least four (4) feet; if from any cause it shall be impossible to remove all the snow and ice which may adhere to such sidewalk, then every such owner, occupant or person having charge shall cover such snow or ice as shall remain with such coating of ashes, sand or other substance as may be necessary to render travel safe and convenient.

Section 2. Whoever shall violate any of the terms or conditions of this ordinance, shall be guilty of a misdemeanor, and on conviction thereof shall be fined in any sum not exceeding fifty (\$50.00) dollars.

Grand Rapids (1915 code, section 925).

Snow and ice must be removed from sidewalks before 9 a. m. Cleaning sidewalks by snow plow is considered sufficient.

Montreal (By-law, adopted March 29, 1910).

The city authorities undertake the removal of snow from sidewalks. An annual assessment of 5 cents per front foot is levied upon the owners of the property af-

fect. This assessment is collected in the usual manner by the city treasurer. The city surveyor keeps an account of all expenses incurred on account of snow and ice removal and makes returns to the city treasurer and city assessors.

REPLACING PAVEMENT CUTS

Practices of Twenty-Eight Cities in Backfilling Trenches and Repaving Over Them—Power Tamping—Flushing—Reinforcing Concrete Base.

The Committee on Street Paving of the American Society of Municipal Improvements, of which Horace Andrews, of Albany, N. Y., is chairman, presented at the recent convention of the Society a report in which were told the practices in 28 cities of the United States and Canada, and also the opinions of engineers in those cities, concerning the general matter of back-filling trenches and replacing pavements over them. The committee sent to a considerable number of cities a list of twenty-three questions calculated to bring out these facts and opinions, and in the report gave abstracts from the information returned in response to these; also a general summary of all the replies.

The following gives briefly an abstract of the general summary of the committee. A few of the more interesting statements contained in the replies received are given also.

The back-filling placed in a trench may be sufficiently compact to support the pavement which is replaced on it, or it may ultimately settle away from the pavement, in which case the pavement and its foundation must act as a beam in supporting the load. In either case, the back-filling of the trench acts as a sort of brace to prevent the sides of the trench from moving inward and thus undermining the pavement each side of the trench. It is the belief of the committee and of most of those who expressed an opinion that both the support of the back-fill and the bridging effect should be developed as far as possible, the latter as a safeguard in case of local or unforeseen defects in the former.

Of those replying, fully one-third stated that repairs made in their cities were not satisfactory, while a good many of the others implied that this was the case.

Concerning the matter of power ramming of back-filling, the replies indicated that this is very little used by city authorities, although somewhat more by the public utility companies. The city engineer of Columbia, S. C., John McNeal, stated that that city had used a light-weight tamping machine operated by a small gasoline engine. The tamper was too light to give satisfactory results. The machine required a capable man to operate it and the process was more expensive than hand tamping.

Most of the power tamping seems to be in such work as filling under railroad ties and around pipes. The only extensive power-tamped back-filling brought to the attention of the committee was that between the retaining walls of a bridge of the New York Connecting Railroad. In this case the material used was largely sand and gravel with some loam, and was well compacted in its natural state, standing with almost vertical slope. This material was spread between the retaining walls in layers twelve inches thick and was compacted with Ingersoll pneumatic back-filling tampers. The twelve inches of loose material compacted to about nine inches, and the volume was only about one-half of one per cent greater than that of the same material in its natural state before excavation. Water was used freely in tamping. The fill was made in the summer and fall of 1914 and no appreciable settlement has been observed since then.

Concerning flushing the back-filling, the general opinion

was decidedly in favor of this when the soil is sufficiently pervious to enable the water to drain away quickly; otherwise, the flushing is very injurious and settling may continue for a year or even for many years before the surplus water will have passed entirely out of the back-filled material. If power tamping is to be used, water flushing can not be used, although moistening may be beneficial.

In Pasadena, California, a fifteen-ton roller is used for consolidating the back-fill of wide trenches. This is the only place reporting this method and since it would seem to be impracticable where water, gas or sewer pipes and house connections cross the trench, it probably could not be used in most places.

It is the concensus of opinion of those furnishing replies that all of the repair work should be done by the municipality through its own trained workmen; but in some cities exception has been made in favor of those public utilities that are so much in the habit of making cuttings that they keep a force of trained men for this purpose. Even then, however, it is urged that strict city supervision should not be dispensed with. Much of the trouble in connection with repairs of this kind is due to the class of workmen who make the cuttings, back-fill and repairs to pavement. Skilled men paid by the day by the municipality and employed exclusively on repair work are preferable to all others for insuring uniformity of excellence in such work.

The personal observation of the committee was that, in repairing stone block pavement, the blocks are very often put back with joints wider than those originally existing, this being proved by the fact that all of the stones removed from the pavement are not returned to it. This, of course, should not be permitted, although its avoidance may require considerable trying of stones to find the largest which can possibly be used as a closer in each course. The committee suggests numbering or in some other way keeping a record of the original position of the stones removed, and returning them to this position.

One of the most serious difficulties in connection with replacing pavement on a concrete base or with a cement filler is that of excluding traffic from the repaired portion for a sufficient length of time to permit the cement to set thoroughly. It was evident from the replies that several cities do not take, in the repair work, the amount of care employed in the original construction of concrete base and cement grouting by allowing a period of at least ten days to elapse before opening to traffic. In some instances it is apparently thought that by covering the newly made repairs with a few inches of earth, traffic may safely be permitted without interfering with the setting of the concrete base or cement grouting; but it is very doubtful whether this is the case.

The treatment of the concrete base to enable it more fully to act as a beam in supporting the load may consist of either increasing the thickness of the concrete or using reinforcement; the latter apparently being the more common. A possible disadvantage of concrete bridging is referred to in the reply from Toledo, Ohio, where mention is made of "the roar that is apt to result from rapidly moving steel-tired vehicles passing over the hollowed space beneath the pavement."

The committee suggests that, while reinforcing the base over cuts may cost more than unreinforced concrete, if it eliminates the necessity of one or more later re-layings of the pavement, it will undoubtedly more than pay for itself, to say nothing of the annoyance to traffic of frequent repairs and the further fact that, in the case of block pavements, repeated re-layings are almost sure to cause chipping of the corners and breaking of the blocks.

From the engineer of the Sage Foundation, New York City, came the statement that concrete roads seemed to be the easiest to repair and that these roads were there-

fore preferred for development work where the roadways were paved throughout before any of the buildings were built and connected to the sewer, water and gas mains. In this case, the repair to the concrete pavement would apparently require fully as much care and as much time for setting as would a concrete base, but the further laying of the wearing surface and delay required therefor are eliminated. Of the various wearing surfaces which are placed upon concrete base, probably bituminous pavements are the least troublesome to replace.

In concluding, the committee states that "power ramming does not yet seem to have been thoroughly developed and made as economically possible as it may reasonably be expected to become when more inventive effort is directed to its need. Certainly, the heavy labor of tamping back-filling may well be supplemented by proper use of power, as in so many other branches of industry."

Some of the more interesting methods and ideas reported by individual cities are given below:

Buffalo, N. Y.; Geo. H. Norton:—In freezing weather frozen material is discarded and filling with cinders and on heavy traffic streets the cut is temporarily repaved with old common stone, placed in the sand or cinders until permanent repairs can be made.

Toronto, Canada; R. C. Harris:—Water flushing has been attempted in streets, unimproved, where a number of years previously sewer had been laid and it was thought that final settlement had been attained, yet with water flushing the trenches settled.

Sage Foundation; C. B. Fancy:—In making repairs in concrete pavement, slopes are made to sides, care being taken that no concrete is fractured along the edges, these edges are painted with neat cement and the concrete then poured flush with the old pavement.

Kansas City, Mo.; L. R. Ash:—An attempt is made to block traffic for one week at least, the blocking as a rule is effectual in new work but in the case of repairs the blocking is not effectual and the traffic is generally on the repaired portions of the street within a day or two after the repairs are made. Winter cuts are filled with old frozen material and warmer weather awaited before the final back-fill and repair.

As a rule at least two repavings are required before settling disappears.

Louisville, Ky.; D. R. Lyman:—Ninety-five per cent. of clay is returned and of sand about 98 per cent.

Usually not more than two repavings are required but if found necessary more repavings are used. Concrete foundation is not reinforced.

Hamilton, Ontario, Canada; A. F. McCallum:—We have decided to remove the concrete base for 12 inches on each side of the excavation and use reinforcement in replacing concrete.

Binghamton, N. Y.; J. A. Giles:—About 90 per cent of the material is returned. In hard-pan regions the material removed is replaced by gas-house cinders for about three feet above the pipe at a cost of 30 cents for a yard and a half. Where gravel exists the flushing with a moderate amount of water is permitted. There are no noticeable settlements in the pavement for the reason that the old shoulder of the concrete base is cut back about 9 inches and have used expanded metal extensively to reinforce the new base. Winter repairs are made with sand jointing, and this is replaced in warm weather. Concrete is blocked from traffic in summer for 48 hours, bricks are laid, grouted, barricaded for sufficient time and heavy bed of sand placed over it when traffic is resumed.

Richmond, Ind.; F. R. Charles:—We prefer not to round up the pavement; in case of further settlement it must be taken up and relaid. This is frequently done at least once. In winter and in bad weather the trench is tamped and the bricks replaced temporarily, using a sand filler, until settlement is completed or weather conditions permit the final relaying. Concrete foundations have at least 24 hours set before laying bricks and the trench is preserved from traffic. In busy streets this is so difficult that we often protect it with 2 to 12 inches of clay and then allow the traffic to go over it.

Longview, Texas; H. N. Roberts:—The reinforced concrete slab does not allow any settlement. In reinforcing we use one-half inch bars 6-in. between centers both ways, and five days are allowed for the concrete to set.

The WEEK'S NEWS

Taxes for Streets in Hot Springs and Joliet—Proposed State Highway Law for Indiana—The Spread of Smallpox—Capital Will Probably Not Have Hydro-Electric Development—Fires in Toledo, Summerside, P. E. I., Peterboro, Ont. and Joliet, Ill.—Fire Alarms in New York City—Ash Collection with Trucks—Bridge Safety for Street Cars—Dallas Grade Crossing Plans—Mortality Rates and "Safety First"—Flood Protection in Ohio.

ROADS AND PAVEMENTS

State Highway Work in Ohio.

Columbus, O.—With the contracts for thirty-eight miles of improved highways to be awarded Dec. 21, the record of the highway department for the year will be 610 miles, at a value of over \$8,000,000. Work on these contracts will not be started until next year and work on many that have been started cannot be completed until next summer. In making contracts for work the following year and tying up the funds of that period, the department is using the method that was criticised by the present administration when it took charge. At that time Highway Commissioner James P. Parker said the work was continuous and had to be planned for the future and contracts had to be made so contractors could get started early in the season and complete their work. The estimates on the contracts to be awarded Dec. 21 aggregate \$759,186.94.

Road Tax Abolished.

Hot Springs, Ark.—The city council has repealed the former \$10 road tax ordinance, which was adopted in 1907, but had never been fully enforced. This ordinance provided that every male citizen of Hot Springs between the ages of 18 and 45 should work ten days on the city streets or roads, or pay \$10 in lieu thereof. The first year this ordinance was passed an effort was made to enforce it, although the citizens protested. A number paid the first, second and third installments, but the ordinance was never fully enforced. Last spring an effort was made to revive this tax and practically all the male citizens of the Fifth Ward were ordered out by the street commission. This action resulted in a big mass meeting and a lengthy petition to the city council. More than 100 citizens were cited to police court for violation of the ordinance in refusing to pay the tax, and a test case was made of it in the circuit court, where the ordinance was upheld. However, there was such vigorous protest from the citizenship that no further effort at enforcement was made.

Big Road Bond Issue Defeated.

Bartlesville, Okla.—Washington County voted overwhelmingly against the proposition to issue \$600,000 in bonds for a rock road across the county from north to south. Bartlesville, the county seat, voted for the bonds by a substantial majority, and they carried in Dewey by eight votes, but the country precincts were overwhelmingly against the proposition. In some of the townships not a single vote was cast in favor of the bond issue. It was proposed to make the cross county rock road a link in the Ozark trail. The defeat of the proposition was a surprise to its promoters as Washington county expected to take the lead in northern Oklahoma in pushing good roads development.

Wheel Tax Passed.

Joliet, Ill.—A wheel-tax ordinance, covering all Joliet vehicles using the streets of this city has been adopted by the city council following a conference with the representatives of the teaming and delivery interests. Mayor Barber and the commissioners agreed on a revised schedule of fees and the measure will take effect Jan. 1, 1917. The lowest rate is \$2 annually and the highest is \$25. A \$20 fee applies to all motor trucks, motor delivery wagons and motor-driven commercial vehicles carrying loads in excess of one ton. The \$25 license will be required for all motor vehicles of over 35 horse power, used for the transporta-

tion of persons for public hire. All licenses are to expire on the 31st day of December, each year. Licenses issued for less than a year will pay a pro rata rate, but no payment shall be less than one-quarter of the annual fee. There are fourteen classes and these will be lettered, with proper designation on each tag. The tag will be issued by the city clerk, upon proper application and payment of necessary fee. The schedule of fees is as follows:

One-horse wagon vehicle, used in transportation of persons only.....	\$2.00
One-horse wagon vehicle, used in transportation of property of any nature.....	3.00
Two-horse wagon vehicle, used in transportation of persons only.....	3.00
Two-horse wagon vehicle, used in transportation of property of any nature.....	5.00
Three-horse wagon vehicle.....	10.00
Four-horse wagon vehicle.....	15.00
Six or more horse wagon vehicles.....	20.00
Motor bicycles of 35 horse power or less, used in the transportation of persons, and not for hire.....	3.00
Motor vehicles (other than motor bicycles) of 35 horse power or less, used in the transportation of persons and not for hire.....	5.00
Motor vehicles and motor bicycles of more than 35 horse power, used in the transportation of persons and not for hire.....	10.00
Motor trucks, motor delivery wagons and motor driven commercial vehicles used for carrying loads in excess of one ton.....	20.00
Motor trucks, motor delivery wagons and motor driven commercial vehicles used in carrying loads of less than one ton.....	10.00
Motor vehicles of 35 horse power or less, used for the transportation of persons for public hire.....	10.00
Motor vehicles of over 35 horse power, used for the transportation of persons for public hire.....	25.00

One provision of the ordinance requires that all fees received from this special tax shall be used for the purpose of repairing streets and alleys in this city, and for no other purpose. The penalty for violation is a fine of not less than \$5 nor more than \$100 for each offense. The ordinance makes no provision for reaching the owners of vehicles living outside of the city, as the state supreme court has decided these cannot be included in a wheel-tax ordinance. Investigation is under way to see if they can be made liable under an "occupational tax."

Federal Bureau Suggests State Highway Law.

Indianapolis, Ind.—Luke W. Duffey, who will be a member of the house of representatives from Marion county in the coming legislature, has received from the federal highway bureau at Washington a draft of a bill for the creation of a state highway department in Indiana. The measure is prepared along lines that meet the ideas of the federal bureau, and which would, if enacted, enable the state of Indiana to participate in the distribution of the federal road aid. Indiana is one of the three states in the Union that has no such department. The bill suggested would create a state highway board, which would be non-political. One member would be the head of the school of civil engineering at Purdue University, and the other two would be appointed by the governor, one from each of the majority political parties in the state. Members of the board would receive \$500 a year and expenses. The board would elect one of its members chairman and would appoint a state highway engineer, who would be the active executive officer of the state highway department. His salary would be fixed by the board. The state highway board and the state highway engineer would constitute the state highway department. The engineer would have power to appoint and fix the compensation of all assistant engineers, clerks and other help, subject to the approval of the board. The state highway engineer would have power to call on county road officials for information concerning roads and bridges. Local

road officials would be authorized to consult with the engineer in regard to any road proposition, thus rendering the services of the engineer available to them in planning and directing their work. In order to obtain state aid in the improvement of a road the board of county commissioners would make application to the state board, and the state engineer would decide whether the application should be granted. The state highway board also could begin highway improvement projects where the county commissioners fail or refuse to do so. Work costing less than \$2,000 could be done either with or without contract, but all work costing over \$2,000 would have to be done by contract, unless no satisfactory bid could be obtained. Rights of way for roads would be provided by the counties free of cost to the state. The cost of road construction would be borne 50 per cent by the state and 50 per cent by the county, except where the work is done without the county money. The cost of maintenance would also be equally divided between the state and the county, but all maintenance would be done by the state highway department or contracted for with the county commissioners, and all would be under the supervision of the highway engineer. If any county refused to do the maintenance work the state board would have power to do the work and charge it against the county. A state highway fund would be created by the levy of a tax of one-fourth of one mill on each dollar of taxable property, which would yield approximately \$490,000, and from the net proceeds of motor vehicle license fees, amounting to about \$550,000 annually. The state board would have authority to work state or county prisoners on the roads when satisfactory arrangements can be made. County highway superintendents would be appointed by the state highway board and each county highway superintendent would be required to pass an examination to prove his fitness for the place.

SEWERAGE AND SANITATION

Federal Sanitary Survey.

South Bend, Ind.—Surgeon Carroll Fox, of the United States public health service, has begun work on the sanitary survey of the city. The survey will include research into conditions concerning milk and water supply, sewage disposal, hospitals and housing in the city. After his research he will make a report in which improvements will be suggested. The health officer will report these suggestions to the council. The \$2,000 appropriated by the council for use by the health department will be used to carry out ideas offered by Dr. Fox. The first few weeks of the surgeon's stay here will be devoted to gathering statistics concerning the health of the different sections of the city with regard to diseases of various types. He will then visit the various sections and determine what shall be done. He will be here the remainder of the year at least and possibly until February or March. The coming of the federal investigator is the result of persistent effort on the part of the city health officer, Dr. C. S. Bosenbury.

Smallpox Near New York.

Hartford, Conn.—Smallpox cases in Connecticut have increased at an alarming rate and the state is threatened by a smallpox epidemic, which may make the recent wave of infantile paralysis in the state small in comparison, according to Dr. John T. Black, secretary of the state board of health. Dr. Black announced recently that sixty-seven cases of the disease had been put on the board's record during the past two months. Five more cases were reported last week to the state board of health. Dr. Black said that prompt action would have to be taken to check the ravages of the disease. He urged that the unvaccinated inhabitants of the state be vaccinated at the earliest possible moment. The present outbreak in Waterbury has been carried to New London and has also been traced to East Haven. At present there are victims of the disease in Torrington, Winsted, Prospect, Harwinton, Naugatuck and Thomaston, as well as in Waterbury and New London. The cases are not confined to the foreign population of the cities. In some cases high school pupils have been stricken. "The disease has developed beyond the limits of Waterbury," Dr. Black has reported, "and the

situation in this state is threatening. Smallpox is a winter disease and this outbreak possesses all the elements of an epidemic which has passed the embryonic stages. The state has no funds to tackle this proposition directly and it has no organization. The most dangerous feature of this situation is that many cases of smallpox—mild ones, it is true—have not been reported. It is safe to say that at this moment, when the epidemic should be throttled, many victims of smallpox, suffering in a mild way, are going about the state without medical attention and endangering hundreds of individuals as well as scores of communities." Although there have been no deaths in the sixty-seven cases reported, Dr. Black said that the situation was of an alarming nature. The school board of Thomaston has already taken action on the epidemic by recommending that all children attending schools submit to vaccination at once if they have not already been vaccinated.

New York, N. Y.—Reports from the U. S. public health service and from the Connecticut state board of health show a disquieting prevalence of smallpox in various parts of the country. The Connecticut cases, mostly in the vicinity of Waterbury, Torrington and Naugatuck, are especially to be feared, because of the intimate railroad connections between these communities and New York City. The last considerable outbreak of smallpox in this city occurred in 1902, when 1,461 cases were reported. The health department warns that in large cities where there is no lack of frequent importation of the virus, where, in fact, the poison is perennial, an epidemic will come about whenever there is a sufficiently large number of persons capable of infection, that is to say, unvaccinated. This accounts for the well-established periodicity of smallpox epidemics. Experience, according to the department, has shown that in New York an epidemic of smallpox may be expected about every ten or twelve years. This is well shown in the following table, which gives the number of cases of smallpox reported in this city since 1874:

1874.....	1,462	1889.....	2	1901.....	1,964
1875.....	3,297	1890.....	5	1902.....	1,516
1876.....	983	1891.....	21	1903.....	43
1877.....	48	1892.....	378	1904.....	74
1878.....	5	1893.....	464	1905.....	46
1879.....	65	1894.....	770	1906.....	100
1880.....	64	1895.....	41	1907.....	58
1881.....	1,338	1896.....	5	1908.....	17
1882.....	702	1897.....	73	1909.....	9
1883.....	26			1910.....	16
1884.....	5	Year Greater City		1911.....	15
1885.....	98			1912.....	22
1886.....	109	1898.....	16	1913.....	20
1887.....	343	1899.....	99	1914.....	24
1888.....	311	1900.....	156	1915.....	2

Factory Survey by Health Department.

Minneapolis, Minn.—A factory survey to reveal conditions under which Minneapolis persons work has been begun by the health department. The work is being done by N. H. Gunkel, hotel inspector. Arthur C. Price, fire marshal, is accompanying him to note fire hazards. In investigating the ventilation inspectors will learn the number of windows, the number of fans in operation, the number of air and light wells and the effectiveness of gravity systems. In investigating dust the inspectors will give heed to the amount of dust-creating machinery and the methods of disposing of dust. As to general sanitation the inspectors will record the cubic air space allotted to each worker; the material of floors and whether they are wet or dry, clean or dirty.

WATER SUPPLY

Expert on City Water Plant Ownership.

Sedalia, Mo.—R. E. McDonnell, of the firm of Burns & McDonnell, consulting engineers, Kansas City, Mo., has been in conference with mayor J. L. Babcock, city engineer F. T. Leaming, city counsellor R. S. Robertson and the water committee. The firm has been retained to make an appraisal of the system of the City Water Company with a view to possible municipal ownership; to prepare plans and estimates for improvements in case of purchase and also plans for an entire new plant with new water supply. Points brought out by a preliminary investigation

seem to indicate that a municipally-owned plant can be operated in Sedalia without an increase in the present tax rate, the dividends from the plant providing for the interest on the bonds voted and automatically paying off the bonds at the same time. The present system provides for only four streams of water in the congested districts in case of fire when there should be as many as twelve lines. The water pressure in case of fire cannot throw a sufficient stream of water on account of the small size of the water mains. It is charged that the reason that the revenue derived from the present water system is so small is because much of the stock is watered. It is pointed out that new mains large enough to accommodate a population two and one-half times as large as that of Sedalia at present could be laid in alleys and parking spaces so that the work would not require the tearing up of pavements. Sedalia has approximately forty miles of water mains. There are thirty "dead ends" in the system. It is planned that the city offer a fair amount for the holdings of the water company, but be prepared to erect a new plant in case the property could not be purchased at a reasonable figure.

Company Need Not Make Extensions.

Mt. Union, Pa.—When extension of lines of a private water company amounts to a necessity, but the company cannot reasonably be expected to make them, the best course, in the opinion of public service commissioner William A. Magee, is for the municipality and private interests to finance the work under agreement with the public service company. Commissioner Magee, at Harrisburg, dismissed the complaint of Mt. Union borough, on behalf of thirty-one residents, against the Mt. Union Water Company. The petition asked that service pipes and fire plugs be installed in newly developed territory. The company answered that the developments are a result of an industrial boom and not evidence of permanent growth. It added that it is unable financially to make the extensions. Magee sustains the company. He says the cost of the extensions might bring heavily increased rates upon the permanent population when the boom subsides. "To meet the existing situation," he says, "it might be suggested to the borough and the private interests involved that they finance the proposed improvement, the same to be amortized by agreement with the respondent out of the revenue received by the latter for a period of years or the investment to be taken over by the company as soon as danger of loss had been reduced to a reasonable degree."

City Reduces Rates.

Portland, Ore.—Recommendations of Commissioner Daly of the department of public utilities, that the meter rates for water be reduced because the meter rates are inequitable with the flat rates, have been adopted by the council. Under this reduction the rates for the first 20,000 cubic feet of water used will be 8 instead of 10 cents for each 100 cubic feet, and for all water used in one month in excess of 20,000 cubic feet a charge of 6 cents instead of 8 will be made for each 100 cubic feet. This reduces the rate to the small consumers about 20 per cent, and to large consumers, including large buildings and factories, 25 per cent. All large water consumers in the city are served with water through a meter, so that all these benefit from the reduction. The rate for swimming tanks, which use unusually large quantities of water, were fixed at 4 cents for each 100 cubic feet, providing the managers of the plunges meet the health requirements of the city as to change of water in the tanks. The only change made in the flat rates was the abolishing of a charge of 10 cents a month for hot water heating systems which consume only a few gallons of water each year. Commissioner Daly said he was favorable to this proposal, providing check valves are required on such heating systems to prevent the hot water running back into the mains and damaging them.

Water and Light Plant Finances.

Elkhorn, Wis.—The electric light department of the municipal light and water plant of Elkhorn was a paying proposition during the year ending June 30, 1916, but the water department shows a deficit. Reports recently filed with the railroad commission show a net income of \$4,808.52

for the year, with a surplus of \$4,065.66 at the close of the year. The water department showed a net operating revenue of \$303.09, with a deficit at the close of the year amounting to \$975.45. During the year just ended the electric department sold \$12,642.08 worth of electric service, of which \$3,037.02 was to the city for street lighting. The total operating expenses amounted to \$10,333.19. The total number of consumers June 30 was 390, a gain of 17 during the year. During the year 209,544 kilowatts of current were generated. The records of the water department would seem to indicate that a higher rate should be charged for water service. According to Superintendent Ohlsson the deficit is accounted for partly by the thirteen flush tanks for the sewerage system, which have been supplied with water totalling about 5,124,000 gallons per year. This would amount to \$512.40 if sold at the low rate. Sprinkling would bring in about \$100, and \$460.27 was charged off for taxes. These sums added would wipe out the deficit and leave a surplus of nearly \$100. During the year just ended the water department sold \$7,590.95 worth of water, of which amount \$3,145.44 was to the city for hydrant rental, and \$10.08 worth was for street sprinkling. The total operating expenses in the water department amounted to \$7,287.86, leaving a net operating revenue of \$303.09, which is also the net income. An appropriation of \$1,278.54 to municipal funds leaves a deficit of \$975.45 for the department.

STREET LIGHTING AND POWER

Condemn Free City Utility Service.

Hamilton, O.—State examiners H. A. Diefenbacher and E. A. Moriarty, who recently made an examination of the books of the city gas, water and electric plants have filed their report. This report strongly recommends that the plants discontinue the giving of free service to the city, such as free street lighting, free fire hydrant service, and free light and water for public schools. It recommends that all this free service be placed on the tax duplicate in order that the plants may have full credit for the service which they furnish. The report covers a period from Oct. 1, 1915 to Aug. 31, 1916. Bonds outstanding in the different plants on Aug. 31, 1916 were found to be: Water, \$257,000; electric, \$175,000; gas, \$230,000; total bonded indebtedness city plants, \$662,000. A new schedule of rates, with very minor changes to make more equitable payments, is recommended for the electric department. The practice of granting special rates, which has been done in a few instances in this department, was condemned, and ordered stopped. The amount of the delinquent accounts is also scored, and is given as \$9,182.49 on Aug. 31, of which 75 per cent. is in the electric department. The report says "previous administrations appear to have made little effort to collect these delinquent accounts, which should be collected even if suit has to be brought, and all plant business put on a strictly cash basis." According to the report there was a deficit of \$21,030.26 in the water department, during that period covered. It is estimated, however, that the city gave free service worth \$32,485, including the supply to fire hydrants, a service estimated to be worth \$21,090. With the free service included the plant actually earned more than \$10,000. The electric department accounts had receipts of \$37,408.75 and expenditures of \$24,326.02, leaving a surplus of \$13,082.73. To this should be added free service and free street lighting, estimated to be worth \$34,555. The gas department had a deficit of \$6,898.05.

New Contract for Street Lighting.

Massillon, O.—The board of control has authorized Service Director W. A. Pietzcker to award a contract to the Massillon Electric & Gas Co. for the installation and operation of a new lighting system and the supply of current, according to plans and specifications drawn by H. C. Swoboda, Pittsburgh electrical engineer. The bid of the local company was the only one received by the city and after an investigation extending over a period of several weeks, city officials say they found it offered the city as much as, and in many cases more than, most cities in the state had. According to the bid of the Massillon Electric

& Gas Co., the city will pay \$21,308 a year for a period of ten years, 40 per cent of this amount being paid each year by property owners in the "white way" district, which is to be built in the business section of the city. The city is now paying on an average of \$14,824 a year, but under the new system it will receive three times as much light in the general lighting system and eighteen times as much light in the "white way" district. Incandescent lamps instead of arc lights will furnish light under the new system. In the "white way" the lamps will be of 250 and 100 candle-power.

In the general installation the lamps will have center suspension or bracket suspension attached to poles and will not be over 16 feet from the ground. There will be a much better diffusion of light as there will be 1,080 lights in the new system as compared to 392 in the present system. The city now has 175 arc lights for which it pays \$69.50 a year each, and 217 incandescent lamps, costing \$12 a year. Gas-filled tungsten lamps on ornamental standards will supply light in the "white way" district. On streets or portions of streets on which trolley cars operate, two lamps will be placed on ornamental standards with an iron trolley pole extending through the standard to support trolley wires. In the remainder of the district only single lamps will be placed on the standards. Under the new system there will be 750 lights in the general street lighting plan and 330 in the "white way." The lights will be operated on an all-night schedule of 4,000 hours a year. At present the lights are operated on a moonlight schedule or 2,000 hours a year. All but 96 of the lamps will burn all night when the new system is in operation. Domestic consumers also will be benefited by the new contract. The minimum rate per month to domestic consumers now is \$1. The light company, according to general manager T. O. Kennedy and city officials has promised to reduce this minimum rate to 50 cents a month. The rates would be: First 15 kilowatt hours per month, 10 cents per KWH, less 10 per cent, 9 cents net; next 20 kilowatt hours per month, 9 cents per KWH, less 10 per cent, 8.1 cents net; all over 40 kilowatt hours per month, 8 cents per KWH, less 10 per cent, 7.2 cents net.

The Proposed Washington Water Power Development.

Washington, D. C.—The proposed development of the Great Falls water power project by the government should not be undertaken until "thorough studies" have been made into all the phases of the project, according to a report made to the Secretary of War by a board of engineer officers appointed last May to investigate the subject. Secretary Baker of the War Department has agreed to this finding of the board, and unless Congress should determine otherwise and proceed with appropriations for the water-power project there appears little probability of any further steps being taken at this time to bring about this development. Friends of the project pointed out that investigation after investigation has been made into the plan to develop water-power in the Potomac river above Washington for the purpose of supplying the government and the District with power and light; that these reports have been favorable, and in 1913, under Col. Langfitt of the Engineer Corps, an exhaustive and favorable report was made, complete in every detail. Congress appropriated \$20,000 to make the investigation conducted by Col. Langfitt, and the entire sum was expended and every detail of the project was worked out. The engineer board which has reported to the Secretary of War consists of Col. Henry C. Newcomer, Lieut. Col. Clement A. Flagler and Lieut. Col. William W. Harts. The conclusions set forth in the report are as follows:

- "1. That the development of water power in the vicinity of Great Falls of the Potomac river is feasible.
- "2. That the development, if undertaken, should follow approximately the lines of the Langfitt-Herschel project of 1913.
- "3. That the development, if undertaken, should provide for an average daily horsepower of about 66,000, with installation for a peak load of 150,000.
- "4. That the cost of the development at the site alone (exclusive of transmission to market and delivery to consumer) will be about \$14,000,000.
- "5. That the unit of cost of power delivered from such development at the bus bars of a central station in Washington would be about 3.6 mills if all the power is used, and that such cost is little if any cheaper than could be obtained by a steam plant.
- "6. That the advisability of developing this power depends

very largely on the market, and that funds should be provided for a detailed canvass of the local market and a study of cost of distribution to all commercial consumers before any opinion of value can be expressed."

The report discusses the market for power which may be developed by the water power plant proposed. It points out that the needs of the federal government and of the District government for light and power, exclusive of the lighting of the streets, will by no means use up all the power generated by the proposed plant. It points out that if the government then sells this power to private consumers it may in the future need this power, and that if it does not sell the power, then it will operate the plant at a loss. At a price at which power could be furnished, with complete development, it is probable that manufacturing interests could be induced to locate in the vicinity of Washington. "Many of these industries, however," says the report, "in the process of manufacture, create liquid refuse of objectionable nature and should not be permitted to locate along the Potomac above the mouth of the Anacostia and particularly above the Aqueduct dam, where such refuse might enter the city water supply. It might even be advisable to seek markets for the surplus current in Baltimore, Annapolis and other neighboring cities. Use of the power for electrification of the steam railways running out of Washington has also been suggested. The crowning objection to manufacturing industries in the vicinity of Washington is the necessary presence of a large manufacturing population, with its natural concomitants of strikes and other labor disorders." The report does not suggest, however, that the street railways and the street lights might be operated by power from this plant, it is observed.

Hydro-Electric Development in New Zealand.

Auckland, New Zealand.—A statement was recently issued by the chief electrical engineer connected with the public works department of New Zealand covering the Lake Coleridge government hydro-electric plant located on the outlet of Lake Coleridge in the Canterbury district in the South Island, this being the first government electric plant on a large scale in this dominion. This plant has cost the government \$1,601,079, and the first year's operation shows that the plant paid operating expenses, although only a small proportion of the power was sold. The government has installed generators with a capacity of 5,000 horsepower, and two additional units are now being put in, which will bring the power up to 10,000 horsepower, and it is thought that all of this will be taken by the traction companies and the industrial interests in and about Christchurch, the industrial section being located 40 to 60 miles from the hydro-electric plant. According to the report, the introduction of hydro-electric power into Christchurch has caused the retail price of domestic lighting to fall from 12 cents to 6 cents per unit, and the retail price for power from 6 cents to 3 cents per unit, and the price for power in bulk from 4½ cents to 1 cent per unit. This seems to demonstrate that the hydro-electric development in New Zealand can be successfully undertaken by the New Zealand government, and it is proposed to install similar plants in the North Island, and with that in view surveys are being extensively made of two special systems, each located within a radius of 100 miles of Auckland.

FIRE AND POLICE

Two Firemen Killed in Big Blaze.

Toledo, O.—Two firemen were killed, one probably fatally injured and a number less severely hurt in a big \$100,000 factory building fire. Capt. Edward J. Welch and hoseman Albert D. Urie were the dead and fireman Henry J. Pratt the most seriously hurt. The three men were pinned down by tons of debris and when found Pratt was held tight by his ankles in the wrecked timbers. For hours medicine was administered to him while his comrades carefully worked away at the wreckage so that it would not crash down suddenly. The other two were drowned in the flooded basement although two fire steamers for hours worked at pumping out the water. The crash in which the

firemen were buried came when five of them were standing on the first floor, 20 feet inside the building, directing a stream of water. Without warning the second floor gave way and fell right through to the basement, carrying the lower floor with it and four of the men. In fighting the fire the department was handicapped by a short force, three fires occurring at the breakfast hour, with an average of only two men to each piece of apparatus instead of the necessary five or seven. The men were also hampered by bursting hose, lines having to be replaced five times within an hour. Chief Elling stated that he had a requisition for 6,000 feet of new hose for a year, but owing to the financial condition of the city he could not get it. Notions, paperbags and merchandise on fire made the blaze difficult to handle.

Canadian Port Swept by Fire.

Summerside, P. E. I.—Damage estimated at \$325,000 was caused at Summerside by the most serious fire in the history of that place. Eighteen business buildings were destroyed and several others badly damaged. The flames were swept from the waterfront into the center of the town by heavy winds. The fire started in the basement of a department store.

Big Fire in Canadian Factory.

Peterboro, Ont.—An explosion and fire destroyed the Quaker Oats factory building here with a loss of eight lives and property damage amounting to about \$1,000,000. A dozen or more other employees are in hospitals suffering with burns and injuries. It is supposed that the explosion was caused by spontaneous combustion. A strong wind fanned the flames and a short time after the fire was discovered every wall had tumbled in ruins and a number of grain elevators were wrecked. Houses in the vicinity of the plant caught fire and the city's court house was badly damaged.

The Brooklyn Storage Warehouse Fire.

New York, N. Y.—The accompanying illustrations show two views of the recent \$100,000 fire in a storage warehouse in Brooklyn. Apparatus from every section of the borough was in service and it was estimated that nearly a thousand firemen fought the blaze. A news item of the fire appeared in these pages in last week's issue.

Two Firemen Injured in Factory Blaze.

Joliet, Ill.—While fighting a fire in a factory here, Joseph Becker and Adolph Odenthal, firemen, were injured by a collapsing wall. When the firemen arrived at the scene the entire plant was in flames. The men attempted to save three freight cars on a nearby siding and then proceeded to the building. When they approached Captain Robert Downey saw the wall suddenly burst out and he shouted a

warning. The men jumped back, but not in time. Although the building was outside the city limits, Chief Royce had responded to the alarm, but when it was found that the building could not be saved and that no adjoining buildings were endangered, he ordered the men back. There was no water available and chemicals had to be used. The total loss was \$70,000.

Key Alarm Boxes Discarded.

New York, N. Y.—The last of the old-fashioned key fire-alarm boxes will be abolished soon, according to an announcement made by Fire Commissioner Adamson. There are 269 of the key boxes still in use in outlying sections of Queens and Richmond. Immediate steps will be taken to do away with the keys on 123 boxes and the remaining boxes will be taken care of when the new fire-alarm system in Manhattan is put into service. Commissioner Adamson reached his decision to equip the key boxes with the new keyless doors after a test had shown that in some cases it was a difficult task to get hold of the key. The average time it took was one and three-quarter minutes. The test showed the uncertainty of the old arrangement, where keys were placed at various houses and stores in the vicinity of street alarm stations. Out of ten boxes for which thirty-six keys had been distributed, the firemen who made the test were unable to get keys at four of the locations on account of the places being closed for the winter, and at another the key could not be found.

Card Index Police Record System.

San Francisco, Cal.—Following closely upon the criticism of the San Francisco police department contained in the report of the Bureau of Municipal Research of New York, Chief of Police D. A. White ordered the card index system installed in the detective department immediately and ordered abolished the "detinue book." Chief White recently secured an appropriation from the Board of Supervisors for the establishment of a detailed reporting system, and plans were being perfected for the installation of this system during the course of the survey. In making his order, Chief White said: "I have long considered this an evil, and all of the big cities have discontinued it. The detinue book has been abused in certain instances by members of the department. In the future men arrested will either be charged at the time of the arrest or they will not be taken into custody until there is evidence upon which to charge them. In almost every instance the defects in the police system criticised by the report of the bureau were pointed out by myself." The new card index will contain a history and classification of all crimes, and will show the progress of the investigation, and thereby the efficiency of the investigating officers. Steps are being taken to improve other conditions pointed out by the research survey. The bureau found that 125 sergeants and cor-



Courtesy, Brooklyn (N. Y.) Daily Eagle.

FIREMEN AT WORK AT BIG STORAGE WAREHOUSE FIRE IN BROOKLYN.

porals are more than is needed to control 760 patrolmen, and recommended a reduction of 20 per cent. It found that reports do not give the higher officers the information which they need. It proposed to place the office of chief in the civil service. The bureau recommended the creation of a department of public safety, which would include a police bureau, represented by a single commissioner.

MOTOR VEHICLES

New Auto Fire Apparatus Installed.

Herkimer, N. Y.—The new motor combination fire truck for the local fire department has been tested and put into service. A representative of the American-La France Company of Elmira has removed a chemical tank from the present chemical truck and installed it in the new truck. A motor driven pump will be placed in the present truck. Beside the new motor apparatus the village now has a horse-drawn engine, a horse-drawn ladder truck and five hand hose carts.

Auto Truck in Ash Collection.

Waltham, Mass.—A report submitted by superintendent of streets Richard A. Jones to Mayor Eben J. Williams shows material saving in the collection of ashes by auto truck as compared with teams. The advantage, aside from the saving, is that a much larger territory is now covered. The cost of maintenance (estimated) and operation of the auto truck in collecting ashes, also the cost of maintenance and operation of teams in use a year ago in collecting ashes is given as follows:

Collection of ashes with auto truck—	
Daily cost of maintenance:	
Depreciation of truck.....	\$3.00
Repairs of truck.....	1.00
Tires	1.00
	———— \$5.00
Daily cost of operation:	
Gasoline, 10 gals. at \$.23.....	\$2.30
Oil, 3 gals. at \$.28.....	84
Driver	3.33
Helpers, 1 at \$2.75; 3 at \$2.50.....	10.25
	———— 16.72
Total	\$21.72
Collection of ashes with teams—	
Daily cost of maintenance:	
6 horses, 2 wagons, 2 tip-cars, including food, shoeing, repairs and depreciation.....	\$7.80
Daily cost of operation:	
4 drivers at \$2.75.....	\$11.00
4 drivers at \$2.50.....	10.00
	———— 21.00
Total	\$28.80
The average daily saving is therefore \$7.08.	

Urges Complete Motorization for New York.

New York, N. Y.—Fire Commissioner Adamson has requested the Board of Estimate for \$1,066,112.75 to motorize the remaining part of the department, and if it is granted the last fire horse will go out and before the end of the coming year the 304 fire companies in the city will be completely motorized. The fire commissioner has strongly urged that the motorization be completed by a single appropriation rather than in installments. He points out that the 720 horses left in the fire department have reached an average age of a little over 13 years. The commissioner also stated that his plan would replace old and obsolete apparatus with the new, up-to-date equipment, would enormously increase the efficiency of the department, render unnecessary the establishment of new companies, and, in addition, result in a saving of at least \$150,000 a year in reduced cost of operation of motor companies. In discussing the needed changes, Commissioner Adamson said: "It costs five times as much to operate an old-fashioned engine company, with the old type coal burning engine, and its separate hose wagon, both drawn by horses, as it costs to

operate the new type single unit gasoline pumping engine, which does the work of the old apparatus and does it better. It costs the city \$1,658.12 per year to operate the old-fashioned horse-drawn, two-piece, coal-burning engine companies, while it costs only \$333.36 each to operate the new combination gasoline engines. This is a saving of \$1,324.75 a year for each company. Besides, an engineer at \$1,700 a year would be required for these new type engines only in the busiest companies, and we would be able to make a saving in that respect. We have not bought a horse for fire service since 1913."

GOVERNMENT AND FINANCE

Detroit's Annexed Territory.

Detroit, Mich.—Following the recent elections, the city now takes in about 70 square miles, counting the sections of Greenfield and Hamtramck townships which were annexed by the election results. Three of the seven annexation proposals were defeated, although there appears to be still some chance of their being claimed, as litigation is still proceeding. The city, however, added 20 square miles to its territory—making 28 square miles since a little over a year ago. The formal additions will make the city 66 per cent larger than it was in 1915.

Mayor Ousted for Bribing with Jobs.

Arkansas City, Kans.—Promising a man an appointment in return for political work just before an election is "bribery." The Kansas supreme court has so held and thereupon ruled that O. S. Gibson, mayor of Arkansas City, be removed from office and the place given to C. N. Hunt, his opponent in the election last spring. According to testimony, Gibson promised the offices of police judge and chief of police to friends who solicited votes for him. Gibson was directed to pay Hunt his salary since April.

City Sells Bonds to State at Good Rate.

Walla Walla, Wash.—City engineer W. R. Rehorn has reported a very successful bond sale by the city to the State of Washington. The issue was \$338,000 water revenue bonds to fund present outstanding bonds. They bear 4 per cent interest and the saving to the city will be very satisfactory. The bonds are in \$1,000 denominations; \$200,000 worth are dated Sept. 1, 1916, due on or before twenty years, one-twentieth to be paid annually; and \$138,000 worth are dated Nov. 1, 1916. The original issue of these bonds was \$467,000, \$217,000 issued Nov., 1899, and \$250,000 issued March, 1906. The net city debt, according to the report of the Bureau of Inspection and Supervision of Public Offices, was:

Dec. 31, 1912.....	\$1,005,139.53
Dec. 31, 1913.....	873,420.96
Dec. 31, 1914.....	797,158.18
Dec. 31, 1915.....	755,871.46

TRAFFIC AND TRANSPORTATION

Car Decelerator for Bridge Safety.

Boston, Mass.—A simple solution has apparently been found to the problem of stopping a train on a bridge before the train reaches the draw. Boston Elevated officials have developed a decelerator device which has given very convincing results. Experiments were begun after the recent serious accident which resulted in so many lives lost. A demonstration was given before the officials and mayor Curley's safety committee. A four-car elevated train was checked in a 25-mile speed and brought to an easy stop within its own length, or 230 feet; a semi-convertible car operated over the same track was stopped in a space of 113 feet, and in both instances the deceleration was so smooth that it caused no annoyance to the passengers. The idea is to be adopted for use on Charlestown bridge and the Cambridge Viaduct as quickly as possible. The device itself consists of a piece of road, about four hundred feet long. It is almost like an unfinished track, with a heavy ballast of crushed stone and no rails. The stone is piled up in

long banks where the rails would be, and is held there by an outside rail and an inside rail running about eight inches apart. The outside rail is a little higher than the inside one, both being covered by the crushed stone. As the train comes along the wheels find their way between the rails and ride on the crushed stone filling, unable to veer to either side. The instant the crushed stones are reached the power gives out, the full length of the train, and nothing but the train momentum drives the dead cars forward. On this kind of a road bed the "going" is so hard that the train soon stops. Only as a final emergency, however, would these decelerators be called into service. The trains will not reach them until everything else has failed and the trains are "dead." Two automatic stops and one manipulated by hand must be passed first, and if the train gets by all three, it switches automatically into a track that guides it into the decelerator.

Commission Rules Against Jitneys.

Wilkes-Barre, Pa.—Following an opinion by the public service commission at Harrisburg that jitney drivers in Pennsylvania must have certificates of public convenience before they can operate cars, Chairman Ainey of the commission has ruled that they must have in addition city licenses. This decision was made in a test case from Wilkes-Barre, whence several hundred complaints against jitneys were filed, and is the fourth bearing on the right of jitney men to operate cars. So far it has been decided that jitneys are common carriers, that they must satisfy the commission that their cars are safe for travel, that certificates are necessary from the state and licenses from the municipality where operated. The new decision holds that ordinances passed under the state motor vehicle regulation of 1915 do not conflict with the authority of the state under the public service company act.

Grade Crossing Elimination in Dallas.

Dallas, Tex.—Plans for the expenditure of approximately \$600,000 to eliminate grade crossings in Dallas have been definitely announced by the engineering department of the Missouri, Kansas & Texas Railway Company. The work probably will begin Jan. 1. Following a number of changes in original plans, the reconstructed arrangement will mean very little reduction in the present street grade. The railway expects to elevate its tracks from 8 to 12 feet along one section of the road. It is not expected that any of the property under the tracks will be affected, if at a distance of more than 200 feet from the roadbed. The city's plans called for the depression of a number of streets beneath the railway tracks. This would have required considerable grade cutting, it was explained, and the subsequent damage to abutting property would have made the project almost prohibitive. When the city was confronted with the problem of paying for damaged property negotiations were begun with the "Katy" engineering department looking to a more satisfactory agreement.

Proposed Canadian Radial System.

Niagara Falls, Ont.—J. N. Sanley, of the Provincial hydro commission, and T. J. Hannigan, secretary of the Ontario hydro-radial association, have met the councils of all the municipalities interested in proposed Welland, Port Colborne and Bridgeburg radial line, and by-laws will be submitted to each of these municipalities at the January election. The line is estimated to cost for construction and equipment \$2,208,716, the annual revenue is estimated at \$323,000, and annual charges at \$315,000, leaving a nominal yearly surplus of \$18,000. This line, the commission states, will be self-supporting, independent of other proposed hydro-radials.

Proposed Trolley System for Scotch City.

Edinburgh, Scotland.—Edinburgh's town council resolved some months ago to take over and operate the street railway system, which consists of cable lines. It was built by the city in 1898 and leased for twenty-one years to a private company, at an annual rental of 7 per cent on the invested capital of £1,300,000 (\$6,326,450). A committee of experts was appointed by the council to consider what method of traction should be adopted on the expiration of the lease to the

private company on June 30, 1919. This committee has reported in favor of an overhead electric trolley system. The capital required for the installation and equipment of an extended system—25 miles of existing double track and 9 miles extension—is estimated at £936,500 (\$4,557,477), compared with an estimated cost of £1,335,750 (\$6,500,427) for an electric conduit system, with no extension of lines. The committee finds that it is practicable to begin the installation of the overhead system immediately, and to have it ready for operation on the expiration of the present lease. The corporation's electric-power station, now under construction, will supply ample current for the proposed new electric tramways. Opinion in the town council, as well as public opinion, seems to be sharply divided between the conduit and overhead systems, and final action may be considerably delayed.

MISCELLANEOUS

Municipal Coal Yard Effective.

Muncie, Ind.—Mayor Bunch announces that he has gained the end he desired when he established a municipal coal yard, and will now retire from the coal business. On the complete backdown of four of the city's largest retail coal dealers, who agreed to sell coal at \$5 a ton delivered instead of the \$6.50, which had been charged by them and the \$4.50 charged by the municipal yard, Mayor Bunch agreed to quit selling coal for the present. The four firms to which the municipal yard business has been handed over say they will be unable to buy coal as cheaply as Mayor Bunch has done and are only taking this action in order to maintain their business in the hope that prices will drop at the mines eventually to the point where they can make a fair profit. "I had promised the public and the dealers themselves that when the prices should drop 25 per cent, I'd go out of the coal business," said the mayor. "I find that in our selling at \$4.50 a ton we were really losing money owing to waste, but not so much that we would have been unwilling to keep on had it been necessary. The city officers now will devote their attention to food prices in Muncie."

Ice-Making Not a Public Utility.

Springfield, Ill.—The production and sale of ice is not a public utility, the Illinois public utilities commission has held, after the receipt of many complaints against ice companies in various parts of the state. These complaints have come particularly from those communities where ice plants have been erected in connection with electric plants. In a recent ruling the commission said: "The law does not define the production and sale of ice as a utility, hence the state commission had no jurisdiction."

"Safety First" and Mortality Rates.

Washington, D. C.—That the "safety-first" campaign inaugurated a few years ago has borne good results, is indicated by the figures for accidental deaths given in the preliminary report on mortality in 1915 issued by the United States Bureau of the Census. For 1913, 54,011 deaths were reported as due to accident; for 1914 the corresponding number was reduced to 51,770, and for 1915 to 51,406; and during this period there was not only an increase in the population of the registration area as it existed in 1913, but an increase in the extent of the area itself. The rate per 100,000 population for accidental deaths fell from 85.3 in 1913 to 78.5 in 1914 and to 76.3 in 1915. There has been a very considerable reduction in fatalities due to railway, street car, mine, and machinery accidents, and the increase in those resulting from automobile accidents has not been as rapid as the increase in the number of machines in use. Deaths due to railway accidents and injuries totaled 6,652 in the registration area in 1915, or 9.9 per 100,000. This number includes fatalities resulting from collisions between railway trains and vehicles at grade crossings. This death rate is the lowest on record, and shows a marked decline during the past 10 years. Deaths resulting from street car accidents and injuries numbered 1,555, or 2.3 per 100,000. This rate, like that for railway fatalities, is the lowest on record, and shows a material falling off dur-

ing the past 10 years. Automobile accidents and injuries caused 3,978 deaths in 1915, or 5.9 per 100,000. The number of deaths from mine accidents and injuries in the registration area in 1915 was 2,009, corresponding to a rate of 3 per 100,000. This rate shows a material decline as compared with the corresponding figure for 1913, 3.6, and a very great decline as compared with that for 1907, 4.8, which is the highest on record. Deaths caused by machinery accidents in 1915 numbered 1,257, or 1.9 per 100,000. This rate also shows a marked decline during recent years, the corresponding figures for 1913 and 1914 being 2.4 and 2, respectively. The highest recorded rate from this cause is 2.5 for 1907. The census figures bring out the astonishing fact that during the year 1915 firearms caused more deaths than railroad accidents, more than five times as many as street car accidents, nearly as many as railroad and street car accidents combined, and more than twice as many as automobile accidents. The total number of deaths due to the use of firearms in the registration area in 1915 was 7,994, corresponding to a rate of 11.9 per 100,000. Of these deaths 3,608 were suicides, 2,885 were homicides, and 1,501 were accidental (including those concerning which the status as to suicide, homicide, or accident was in doubt). The suicidal use of firearms has increased from year to year since 1913; the frequency of accidental deaths due to their use shows a slight decline during recent years; and the homicidal use of firearms shows a decline as compared with 1913 and 1914, but an increase as compared with 1910, 1911, and 1912. No separate data as to homicides by firearms for the years prior to 1910 are available.

City to Expose Short Weight Dealers.

Toledo, O.—Service director Goodwillie has notified sealer of weights and measures Becker to make a complete report on all violators of food laws and short-weight merchants. They will be warned and unless illegal practices are stopped their names, addresses and the complaints against them will be published in the official City Journal starting Jan. 1. Gasoline short measurers, short-weight grocers, butchers and coal dealers, and food adulterators will be dealt with particularly vigorously. Mayor Milroy and health commissioner Selby, who receives daily reports of food adulterations from city chemist Reed, have approved of the plan.

Establish Validity of Flood Protection Plans.

Dayton, O.—After long litigation and delay the Supreme Court at Columbus has sustained the establishment of the Miami Flood Conservancy District when it overruled the appeal for more than 500 residents of Miami, Clark and Shelby Counties from the action of the Montgomery County Court in creating the conservancy district. E. A. Deeds, of Dayton, together with more than 500 other voters, on February 18, 1914, petitioned the Common Pleas Court at Dayton for the creation of a district including parts of Montgomery, Butler, Hamilton, Preble, Warren, Green, Clark, Miami, Shelby and Logan Counties. Five out of nine judges authorized establishment of the district. The plaintiffs insisted that although Logan County withdrew Judge Hoover of that county should have been a party to the deliberations, in which case the votes of six judges would have been necessary to create the district. The Appellate Court held that five judges constituted a majority. The plaintiffs also claimed that Clark, Greene, Preble and Warren Counties would derive no benefit from the proposed district. The plaintiffs were represented by prosecuting attorneys Goodrich of Miami, Mills of Shelby and Ballard of Clark Counties. Previous to this decision final judicial approval had been given to the plan by the board of conservancy directors, which consisted of nine judges, selected from the nine counties constituting the district. The official plan as adopted provides for the construction of great earth dams or detention reservoirs at advantageous points in the valley, coupled with improvement of the river channel. The system is known as the Morgan flood protection plan. The entire protective plan contemplates the expenditure of approximately \$25,000,000. This will be assessed against the district benefited. The next step will be the filing before county courts of the report of the board of appraisers. The conservancy directors will now advertise for the sale of the bonds.

LEGAL NOTES

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Meaning of Words—Use in Charter.

(Cal. App.) Where words have been given by the courts a particular meanings, it must be presumed that they were used with such meaning in framing a city charter, in the absence of limiting clauses.—*West v. City of Oakland*, 159 P. 202.

Police Power—Jurisdiction of State and Municipality.

(Mont.) However positive the terms of the grant of police power to the municipality, the state will be held to have retained its original jurisdiction over the same subject and to possess the authority to exercise it concurrently with the municipality.—*Public Service Commission of Montana v. City of Helena*, 159 P. 24.

"Public Utility"—Limitation of Indebtedness.

(Okla.) A public water works system, owned exclusively by incorporated city or town, is "public utility" within Const. art. 10, § 27, relating to limitation of indebtedness.—*Dunagan v. Town of Red Rock*, 158 P. 1170.

Sewer Under Street—Violation of Right.

(Mo. App.) The maintenance of a sewer pipe under a street, which did not change the flow of surface water as much as an ordinary culvert, was not a violation of rights of owner of land flowed thereby.—*Cornet v. Meckel Realty & Investment Co.*, 187 S. W. 622.

Issuing Bonds—Power of Council.

(Okla.) Under Const., art. 10, sec. 26, a town council has no power, without express vote of the people authorizing it, to create present indebtedness to be paid out of the revenues of future years.—*Eureka Fire Hose Mfg. Co. v. Town of Granite*, 159 P. 308.

Water System—Special Funds—Payment of.

(Wash.) Under Rem. & Bal. Code, sections 8005-8010, ordinance for construction of water system held to create two funds, so that contractor, performing work not contemplated by original plan, was entitled to mandamus to compel the city to issue special water fund warrants, payable out of system's earnings.—*State v. City of Tacoma*, 159 P. 765.

Damage by Sewers—Evidence of Negligence.

(N. H.) Plaintiff, in action for damages alleged to have been caused by negligent failure to clear sewers so as to care for storm flow, has the burden of furnishing affirmative evidence of negligence.—*Soucy v. City of Manchester*, 98 A. 518.

Power of City in Garbage Collection—Nuisance.

(Ga.) Though municipal authorities have plenary power in collection and disposition of garbage, they may not create dangerous nuisance, and individual specially injured has right of action for nuisance so created.—*Kea v. City of Dublin*, 89 S. E. 484.

Municipality's Power to Contract.

(Ga.) A municipal corporation has no power to contract or incur liability not authorized by its charter, or some joint law of the state, and a contract not so authorized is void.—*Barrett v. City of Atlanta*, 89 S. E. 781.

"Revenues" from Municipal Waterworks—Uses.

(Mont.) Under Const. art. 13 sec. 6, authorizing the Legislature to empower municipalities to provide waterworks, providing they be owned and controlled by the city, the revenues therefrom to be devoted to discharge the indebtedness, "revenues" means the gross receipts less necessary operating expenses, against which expenses of regulation, if it is reasonable, are properly chargeable.—*Public Service Commission of Montana v. City of Helena*, 159 P. 24.

NEWS OF THE SOCIETIES

Calendar of Meetings.

Dec. 26-28.—SOCIETY OF AMERICAN BACTERIOLOGISTS. Annual meeting, New Haven, Conn. Secretary, Dr. A. Parker Hitchens, Glenolden, Pa.

Dec. 27-30.—AMERICAN ECONOMIC ASSOCIATION. Annual meeting, Columbus, Ohio. Secretary, A. A. Young, Ithaca, N. Y.

Dec. 27-30.—AMERICAN STATISTICAL ASSOCIATION. Annual meeting, Columbus, O. Secretary, Carroll W. Doten, 491 Boylston street, Boston, Mass.

Dec. 28-31.—AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Annual meeting, New York City. Secretary, L. O. Howard, Smithsonian Institute, Washington, D. C.

Dec. 28-31.—AMERICAN POLITICAL SCIENCE ASSOCIATION. Annual meeting, Cincinnati, O. Secretary, Chester Lloyd Jones, University of Wisconsin, Madison, Wis.

Jan. 10-13.—AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. Annual convention, New York, N. Y. Secretary, J. C. Olson, Cooper Union, New York, N. Y.

Jan. 15.—AMERICAN INSTITUTE OF CONSULTING ENGINEERS. Annual meeting, New York, N. Y. Secretary, F. A. Mollitor, 35 Nassau Street, New York, N. Y.

Jan. 17-18.—AMERICAN SOCIETY OF CIVIL ENGINEERS. Annual meeting, New York, N. Y. Secretary, Charles Warren Hunt, 220 West 57th Street, New York, N. Y.

Jan. 18-19.—AMERICAN FORESTRY ASSOCIATION. Annual convention, Washington, D. C. Executive Secretary, P. S. Ridsdale, 1410 H Street, N. W., Washington, D. C.

Jan. 19.—AMERICAN SOCIETY OF ENGINEERING CONTRACTORS. Annual meeting, New York, N. Y. Secretary, J. R. Wemlinger, South Ferry Building, New York, N. Y.

Jan. 20, 1917.—WESTERN PAVING BRICK MANUFACTURERS' ASSOCIATION. Kansas City, Mo. Secretary, G. W. Thurston, 416 Dwight Bldg., Kansas City, Mo.

Jan. 23-25, 1917.—AMERICAN WOOD PRESERVERS' ASSOCIATION. Annual meeting, New York City. Secretary, F. J. Angier, B. & O. Mt. Royal Sta., Baltimore, Md.

Feb. 5-12, 1917.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

Feb. 7-15, 1917.—TENTH CHICAGO CEMENT SHOW. Coliseum, Chicago, Ill. Secretary, Blaine S. Smith, 210 South La Salle Street, Chicago.

Feb. 8-10.—AMERICAN ASSOCIATION OF ENGINEERS. National convention, Hotel La Salle, Chicago, Ill. Headquarters, 29 La Salle Street, Chicago.

Feb. 8-10, 1917.—AMERICAN CONCRETE INSTITUTE. Hotel La Salle, Chicago, Ill. Secretary, Harold D. Hynds, 1418 Walnut Street, Philadelphia, Pa.

Feb. 12-14, 1917.—AMERICAN CONCRETE PIPE ASSOCIATION. Annual convention, Chicago, Ill. Secretary, E. S. Hanson, 538 South Clark Street, Chicago, Ill.

Feb. 19-24, 1917.—SOUTHWESTERN CONCRETE ASSOCIATION. Annual meeting and concrete show, Convention Hall, Kansas City, Mo. Chairman, Show Committee, Chas. A. Stevenson, 1433 West 10th Street, Kansas City, Mo.

May 8-10.—NATIONAL FIRE PROTECTION ASSOCIATION. Annual meeting, Washington, D. C. Secretary-treasurer, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

Nov. 12-16.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual convention, New Orleans, La. Secretary, Charles C. Brown, 469 Transportation Building, Chicago, Ill.

American Civic Association.

The American Civic Association during its last fiscal year spent more than \$11,000 in promoting ideals of civic reform, according to the annual report of the treasurer, William B. Howland of New York, submitted at the morning session of the twelfth annual convention, held at Washington, D. C., Dec. 13 and 14. That its slender balance of funds remaining is an improvement over the usual annual deficits of a few years ago, and yet, on the other hand, that any larger balance would be an evidence of guilt in not utilizing to the full the powers of the organization, was the comment of the treasurer.

All of the officers of the association were unanimously re-elected. They are: President, J. Horace McFarland, Harrisburg, Pa.; first vice-president, Dr. John Nolen, Cambridge, Mass.; treasurer, William B. Howland, New York City; secretary, Richard B. Watrous, Washington, D. C.; vice-presidents, Mrs. Edward W. Biddle, Philadelphia; Arnold W. Brunner, New York City; George B. Dealey, Dallas, Tex.; J. C. Nichols, Kansas City, Mo.; J. Lockie Wilson, Toronto, Canada; Miss Margaret Woodrow Wilson, Washington, D. C.; Clinton Rogers Woodruff, Philadelphia, Pa.

A new executive board was chosen. St. Louis was selected as the place of the next convention.

A special tribute to the personal enthusiasm and ability of Stephen T. Mather, assistant to the Secretary of the Interior, for "services of an extraordinary character" in promoting the welfare of the national parks was paid both by President McFarland and Secretary Watrous. "He is serving this country as the systematizer of the parks and the generous supplementer of the treasury, through his private means, in supplying deficiencies in their support," said Mr. McFarland.

Secretary Watrous informed the convention that the society is growing at the gratifying rate of a member a day.

In point of commercialism billboard men rank next to saloonkeepers, and both businesses are "on the toboggan," said the president in introducing Jesse Lee Bennett of Baltimore, chairman of committee on billboards, the keynote of whose report was that the greatest possible profit from billboards is infinitesimal, compared to the maximum of harm worked to a community through their existence.

That the lack of civilization of a country may be judged by the amount of noise it permits its citizens to make, and that noise is a cause of industrial inefficiency, was the statement of Mrs. Imogen B. Oakley of Philadelphia, chairman of the committee on noise nuisance. She reported that Rochester, N. Y., has gone farther in its campaign than any other American city and that her committee will draft a model anti-noise ordinance and urge its passage in many cities.

"The Invisible Peril," a film story produced by the Louisville Women's Civic Association, dealing with the garbage problem, concluded the morning program.

An entire replanning of the rural road system of the United States, some of which was planned as much as a century ago to accommodate vastly different traffic conditions, was advocated by Prof. Frank A. Waugh of the Massachusetts Agricultural College, at the afternoon's meeting. Prof. Waugh acted as chairman.

"The Economics of Good Roads" was the topic of Herbert Quick of the federal farm loan board, while Albert D. Taylor, professor of landscape architecture in Ohio State University, talked on "The Relation of the Landscape Architect to Country Planning."

Logan Waller Page, director of the office of public roads and rural engineering, discussed the planning and planting of country roads, and pictures illustrative of that topic were shown by M. O. Eldridge of the same office.

Wednesday evening's session, held under the auspices of the Real Estate Brokers' Association of Washington, and presided over by George Y. Worthington, its president, was featured by an illustrated address on "Government City Planning and Park Development as Applied to the National Capital," by Col. W. W. Harts, superintendent of public buildings and grounds, secretary to the fine arts commission and executive officer of the Rock Creek parkway commission.

Northwestern Road Congress.

The annual session of this convention was held at Chicago, Dec. 7 and 8. The annual address of President Hazelwood was devoted to a resume of highway conditions with especial reference to the new federal aid law. Mr. Hazelwood said, in part:

"The federal aid law as passed by congress and approved by the president, is by far the most practical piece of highway legislation that has ever been considered by the United States. It is reasonably free from jackpot and pork barrel features in that it proves a fair system of distribution and for the construction of adequate types of roads under efficient supervision. No state can take advantage of the provisions of the federal aid law unless the legislature consider the matter and pass laws enabling the states to provide the necessary funds to pay their share. The legislatures of the several states have a large responsibility on hand to work out a practical method of procedure to spend the federal aid money together with state and county money so that the best results will be obtained.

"The federal government is insisting that the several states present a complete five-year program showing where the federal money is to be expended. The government will insist on the money being spent only on the trunk line highways of the several states.

(Continued on page 789.)

PERSONALS

Bartlett, George A., has been re-elected for his twentieth term as chief of the San Mateo, Calif., fire department.

Bigelow, E. M., Director of Public Works of Pittsburgh, Pa., died December 6 after a short illness.

Block, Herman, for 21 years chief of police of Watertown, Wis., has resigned.

Landis, Harry M., city treasurer of Pittsburgh, Pa., died Dec. 7.

Mace, Richard T., of Keeseville, N. Y., has been appointed highway superintendent of Clinton county.

Rutter, Robert, has resigned as city auditor of Waltham, Mass.

Steever, M. D., has been appointed city clerk of Pittsfield, Mass.

Walden, S. D., has been elected director of the Lincoln Highway Association.

Watson, T. R., former city clerk and alderman of Passaic, N. J., died December 6.

The following mayors have been elected in New Jersey:

Belvidere—George M. Widenor.
Butler—Edward K. Robert.
Caldwell—Dr. Edward E. Peck.
Camden—Charles H. Ellis.
Cranford—John W. Heins.
East Orange—Worrall F. Mountain.
Elizabeth—Victor Mravlag.
Flemington—Arthur F. Moran.
Garwood—William R. Conklin.
Hackensack—Milton Demarest.
Hackettstown—Claude E. Cook.
Haledon—William Brueckman.
Hopatcong—Theodore A. Gessler.
Keyport—Rufus O. Walling.
Mendham—Edward Elliott.
Monmouth Beach—Abram O. Johnson.
Morristown—Clifford Mills.
Newark—Thomas L. Raymond.

North Caldwell—William Little.
Ogdensburg—Patrick J. Dolan.
Perth Amboy—John T. Ten Broeck.
Plainfield—Leighton Calkins.
Red Bank—Arthur U. Patterson.
Roselle Park—Arthur M. Crane.
Roseland—Dr. Joseph C. Conover.
Salem—W. A. W. Grier.
Union Hill—William A. Brady.
Weehawken—Emile Grauert.
West Caldwell—Zenas G. Crane.
Westfield—Harry W. Evans.
West Orange—William F. Vosseler.
West Long Branch—Arthur F. Golden.

The following mayors have been elected:

Wichita, Kans.—O. H. Bantley.
Jackson, Miss.—W. A. Scott.
The following officials have been elected in Oregon:
Marshfield—Duncan Ferguson and T. B. Jones, councilmen; J. W. Butler re-elected recorder.

Empire—Mrs. T. J. Macgenn, C. G. Hockett, J. O. Capron, A. A. Nicholls and Captain James Magee, councilmen; James Mackie, recorder.

East Side—Councilmen R. T. Whitty, M. A. McLaggan, W. L. Walker and M. L. Hunt; Malcolm McLean, treasurer; C. P. Keating, recorder; Sylvester McGriff, city marshal.

Sumpter—Members of the council re-elected are: A. J. Denny, John H. Clark, J. L. Hayden, Charles Bacon and F. I. Wilson.

Echo—A. B. Thomson, major; Frank Spike, George H. Coppinger and R. R. Lewis, councilmen, and R. B. Stanfield, treasurer.

Aumsville.—T. W. Johnson re-elected mayor; W. C. Anderson, F. F. Rahn, F. A. Garbe and Gerben Donker, aldermen.

Nehalem—Mayor, Frank A. Rowe; recorder, Ward L. Mayor; treasurer, Ellis Madden; councilmen, Fred Seeley, Ed Kelley and Sam Lundburg.

Cove—Mayor, F. A. Galloway; recorder, S. H. Weimer; councilmen, R. J. Allen, H. E. Blevins, M. J. Duffey; treasurer, J. H. McCall; marshal, W. F. Breshears.

The following have been elected in Washington:

Pe Ell—C. W. Boynton, treasurer; Ellis Sage, John Boyer and J. T. Hatfield, councilmen.

Toledo—Fred Williams re-elected mayor; I. W. Shulz and D. S. Farrell, councilmen, and Joseph M. Boyles, treasurer.

Vader—Mayor E. C. Brous, re-elected; A. N. Cheney, treasurer, and E. C. Eyerley, Edward Groleau, William Perry, John Becker and Edward Riffany, councilmen.

Winlock—Gordon Sweany, A. W. McFee and W. L. Morgan were elected councilmen, and Clyde Kennedy, treasurer.

Cathlamet—A. N. Friedrichsen, W. H. Smith and George Hannigan, councilmen for two years; J. W. Heron, one year; treasurer, C. H. Warren.

Woodland—L. N. Plamondon, mayor; Ben Barr, treasurer; E. E. Heald, C. E. Dunham and E. E. Dale, councilmen.

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Ford, Ont., is planning to construct a SEWER SYSEM to cost over \$112,000. The engineer to prepare designs is T. A. Murray, 303 Lumsden Building, Toronto, Ont.

A SEWAGE DISPOSAL PLANT is to be constructed by Centerburg, O. The engineers selected to prepare plans are the Richards Engineering Co., 37½ E. Long street, Columbus, O.

The Lawrence, Mass., Bridge Commission is making a number of BRIDGE IMPROVEMENTS. The consulting engineer of the commission is B. H. Davis, 17 Battery place, New York, N. Y.

Dows, Ia., is to construct a SEWER SYSTEM and DISPOSAL PLANT to cost \$22,000. The engineers for the work are M. Tschirgi & Sons, 712 American Trust Building, Cedar Rapids, Ia.

Munden, Kans., is to construct an ELECTRIC LIGHT PLANT and WATERWORKS at a cost of \$20,000. The engineers consulted on this project are Stevens & Stiles, 222 Commerce Building, Kansas City, Mo.

Marshfield, Wis., is receiving bids for the construction of a SEWAGE DISPOSAL PLANT and a WATER SUPPLY SYSTEM. Plans and specifications for the work were prepared by J. F. Druar, 312-316 Commercial Building, St. Paul, Minn.

Sedalia, Mo., is dissatisfied with the services of the local WATER company and is making an appraisal of the plant with a view to purchase and improvement. An entirely new plant is also being considered. The city has retained Burns & McDonnell, Interstate Building, Kansas City, Mo., as consulting engineers to investigate the whole situation.

In improving its WATERWORKS, the city of Martins Ferry, O., is having plans prepared by Burgess & Long, 8 East Long street, Columbus, O.

Rogerville, Tenn., is to construct a WATERWORKS PLANT to cost \$25,000. The engineer for the work is J. N. Ambler, Winston, N. C.

A FILTRATION PLANT is to be installed by Camas, Wash., plans for which are now being prepared by L. B. Wickerson, Chamber of Commerce Building, Portland, Ore.

The town of Newark, Del., is to make improvements to its WATERWORKS. The city has retained Kastenhuber & Anderson, Easton, Md., as engineers to report and recommend on the proposition.

Before accepting a new PAVEMENT about which there has been a great deal of discussion as to defects in its construction, the city of Elkhart, Ind., had the pavement investigated by Lester Kirschbraun, 160 North 5th avenue, Chicago, Ill.

A WATER SUPPLY SYSTEM, including a pumping station operated by oil engines, reservoir, hydrants, valves and mains, is to be constructed by Independence, La. Plans and specifications have been completed by the consulting engineer, Xavier A. Kramer, Magnolia, Miss.

The city of Bayonne, N. J., is to improve its SEWAGE DISPOSAL methods. The sewage is at present discharged through some fifteen separate outlets into New York Bay, the Kill van Kull and Newark Bay. The city has retained George A. Johnson, 150 Nassau street, New York, N. Y., as consulting engineer to prepare plans for the proposed system.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—New inquiry for pipe for municipal purposes is limited to the proposed purchase of 1,500 to 2,200 tons at St. Paul. Contracts closed recently included 1,250 tons for Eveleth, Minn., awarded to the American Cast Iron Pipe Company; 1,150 tons at Ann Arbor, Mich., to the National Cast Iron Pipe Company, and 600 tons at Erie, Pa., to R. D. Wood & Co. A further advance of \$2 per ton has been announced in the price of pipe. Quotations: 4-inch, \$44.50; 6-inch and larger, \$41.50; class A, \$1 extra. Birmingham—To the surprise of the water and gas pipe makers, specifications for renewals and for quantities of pipe that must be had come in regularly and amount to an aggregate that does not point to the diminution of foundry operations for some time to come. Reports from the field since the last raise in prices are more encouraging than was expected would be the case. Quotations: 4-inch, \$37; 6-inch and upward, \$34; special lengths, \$1 extra. New York—The only recent public letting of importance is that of Worcester, Mass., on which bids were opened for 800 to 900 tons. Private buying has kept up well, but the time is rapidly approaching when seasonable dullness is to be expected. Pipe manufacturers have made another advance of \$2 per ton. Quotations: 6-inch, class B and heavier, \$41.50; class A, \$42.50.

Lead.—Lead is higher, with but little offered. Quotations: New York, 7.90 cents; St. Louis, 7.80 cents.

Infringement Suit on Sewer Cleaning Patents.—The Turbine Sewer Machine Co., 195 Eleventh street, Milwaukee, Wis., has started suit in the United States Court against William J. Stevenson for infringement of its patent on turbine sewer cleaning machines. The complainant asks that the alleged infringer be restrained from manufacturing this type of equipment.

Test of Street Washing Machine.

A test was held in New York City, December 13, of the Sterling-Kindling motor squeegee street washing machine. Here the machine demonstrated its ability to clean smooth pavements rapidly and thoroughly. The apparatus is the product of the Sterling Motor Truck Co., West Allis, Wis., and the Kindling Machinery Co., Milwaukee, Wis., and consists of a Sterling worm-driven chassis upon which is mounted a 1,000-gallon steel tank. Placed in front of the front fenders of the chassis are two flusher nozzles controlled by the driver by means of a lever. These flusher nozzles sprinkle the street and prevent dust from rising, at the same time wetting the pavement and making it easier to loosen the attached matter. Under the machine is fitted a revolving broom which forces aside the large refuse so that the squeegee following

can remove the tightly adhering matter left. Squeegee and broom may be raised out of contact with the pavement. The tank is fitted with a water meter.

This type of machine has been used with success in Milwaukee as described in Municipal Journal, January 27, 1916. In tests in New York and Philadelphia it performed very well, but in both places was handicapped by traffic, since, owing to freezing weather during the night, it had to be tested during the day.

The Buffalo Meter Company, 2917 East Main street, Buffalo, N. Y., will continue to furnish meters to the city of Toledo, O. A contract for \$38,062 worth of different sizes of meters has just been awarded to the company by service director Goodwillie.

While the manufacturing facilities of the **Federal Motor Truck Company,** Detroit, Mich., have been doubled during the past year, plans are already under way to construct another large assembling plant that production may be further increased during 1917, according to M. L. Pulcher, vice-president and general manager of the company. So great has been the demand for Federal trucks from the dealers, that it has become imperative to make way for a much increased production at once. Plans are being prepared for another large building, and it is expected that the structure will be completed by early in the spring.

The Waterworks Manufacturers' Association held a special meeting of the executive committee Dec. 20 at the Machinery Club, New York, N. Y.

The Electro Bleaching Gas Co., 19 East 41st street, New York, N. Y., has been awarded a contract by the water and light committee of Collingwood, Ont., Canada, for a chlorination plant.

The Troy Wagon Works Company, Troy, O., has appointed as its representatives in New Orleans the O'Rourke-Miller Motor Company. The new branch will show a complete line of the Troy trailers.

NEWS OF THE SOCIETIES

(Continued from page 787.)

These highways must connect wherever possible. No part of the federal aid will be available to any state which has not an organized highway department through which negotiations for securing the money and control of the actual building of the improvement can be conducted. In the selection of the roads to be improved the federal government is going to exercise protection against yielding to local interests. Long distance routes will be those ever in mind when the matter is under consideration by federal officials.

"The most feasible plan will be to operate the expenditure of the federal aid money through the state and fed-

eral officials working together. The state is the smallest unit that should be allowed to help in determining a policy of the expenditures, for road improvement and maintenance of any of this federal money.

"For the full five-year period there will be allotted the following amounts to the four states mentioned: Wisconsin, \$1,925,416.05; Minnesota, \$2,135,910.90; Illinois, \$3,313,893.45; Iowa, \$2,192,634."

American Association for the Advancement of Science.

It has been decided to hold two joint meetings to discuss highway engineering subjects in the assembly hall of the Automobile Club of America, New York, on Thursday, December 28.

These are being promoted by engineering section D of the American Association for the Advancement of Science. The first session, beginning at 2 o'clock P. M., will be devoted to a consideration of road subjects to be included in the civil engineering curricula of universities and colleges. This meeting will be held under the auspices of the A. A. A. S., the Society for the Promotion of Engineering Education, the National Automobile Chamber of Commerce and the National Highways Association.

At the second session, beginning at 8 P. M., research papers in various fields of highway engineering will be presented, including several pertaining to the use of motor trucks and their relation to highway construction. It will be under the auspices of the Automobile Club of America, the American Association for the Advancement of Science, the N. A. C. C., the National Highways Association and the Citizen's Street Traffic Committee of Greater New York.

New Jersey Sanitary Association.

The problem of eugenics was discussed in its biological, sanitary, professional and social aspects by the New Jersey Sanitary Association at its forty-second annual meeting, held Dec. 8 and 9, at the Laurel-in-the-Pines, Lakewood. The following officers were elected at the final session:

President, State Commissioner of Education Dr. Calvin N. Kendall of Trenton, who was first vice-president of the organization; first vice-president, George W. Fuller of Summit; second vice-president, Charles J. Fisk of Trenton; third vice-president, A. Clark Hunt of Metuchen; secretary, Dr. Edward Guion of Atlantic City, and treasurer, Colonel George P. Olcott of East Orange. Health Officer Chester H. Wells of Montclair was chosen chairman of the executive council.

Dr. Charles V. Craster, Newark health officer, made a plea for better educated health employees and declared that such preparation would react to the good of the community to a degree which could not be measured.

Discussion of the sanitary aspect of eugenics was opened by Dr. Christopher C. Beling of Newark. Judge

Robert Carey of Jersey City told how to obtain the passage of proper sanitary laws.

Need for additional water supply and state conservation in North Jersey were urged by Chief Engineer Morris R. Sherrerd of the Newark Board of Works. The subject was discussed by Board of Works Commissioner Arthur R. Denman of Newark and George W. Fuller, consulting engineer of Summit.

Mr. Sherrerd asserted that state commissioners, in a measure, handicapped municipalities in their efforts to obtain additional water by over-zealousness to control the waters of the state.

Kentucky County Road Engineers.

Problems incident to good roads in the state will be the chief topic discussed at the meeting of the County Road Engineers' Association, to be held at Bowling Green, Ky., Jan. 17 and continuing through four days. Invitations have been sent to every county judge in the state, asking that each county send to attend the meetings its entire fiscal court and the county road engineers.

W. H. Edwards, county road engineer of Woodford county, will preside at the opening session. Mayor Alex Patterson, of Bowling Green, will deliver the address of welcome, and J. Russell Gaines, county road engineer of Jefferson county, will respond.

Col. Edmund Wright Taylor, Jr., vice president of the Jackson Highway Association, will be among the speakers. Practically every county in the state will be represented at the meeting.

Commissioner of Roads Rodman Wiley states that the executive committee has decided that the convention shall deal with practical problems in Kentucky. A half day will be given over to a discussion of their problems by county judges and a whole day will be devoted to an inspection of the Edmonson county rock asphalt field and Warren county roads.

Gov. Stanley and President H. H. Cherry, of the Western State Normal School, will deliver addresses. It is probable that some road expert of national fame will be on the program.

Among the topics to be discussed will be "Construction of Earth Roads," "Construction of Macadam Roads," "Value of Good Roads," "Resurfacing of Old Macadam Roads," "Maintenance of Roads," and "Tests of Road Building Materials." In addition to these speeches will be made generally on good roads topics.

A feature of one day's proceedings will be a visit to the asphalt fields of Edmonson County, and of another an inspection of the inter-county seat roads of this county.

Southwestern Concrete Association.

The Southwestern Concrete Association announces the first annual southwestern concrete show to be held in connection with the association's annual convention at Kansas City, February 19-24, 1917.

In addition to providing the opportunity for manufacturers to meet their public in this section of the country, the management has provided a program for the evening sessions for interesting and educating the general public to the value of cement and concrete. For this reason the operation of exhibits will be prohibited during the evening sessions. The Saturday morning and afternoon sessions will be devoted entirely to a good (concrete) roads day program.

The southwestern concrete show will follow the Chicago cement show at an interval of four days and will precede the Mid-West (Omaha) cement show by one week.

West Florida Highway Association.

The second annual meeting of this society was held at Pensacola, Dec. 11. Tallahassee was chosen for the next annual meeting and the following officers elected:

R. W. Storrs of Walton county, and editor of the De-Funiak Breeze, president; T. J. Appleyard of Leon County, publisher of the Tallahassee Record, vice-president; W. M. Herrider of Escambia county, circulation manager of the Journal, secretary, and Peter Rollo of Escambia county, treasurer.

The following members of the executive committee were elected: Peter Tomasello, Santa Rosa; John M. Calhoun, Jackson; D. M. Lowry, Leon. John M. Calhoun of Marianna, president of the West Florida Highway Association, outlined by way of annual report, the results of the past year's work. The organization did not have much money, he said, but by working with county commissioners and agitating good roads on every occasion, had produced many miles of highway—not the best in the world, to be sure, but better than what had been there before. The necessity of bridges was also stressed—especially the Choctawhatchie and Chattahooche bridges. If Florida built its highways rightly, it could look to their nationalization by the federal government, in line with its preparedness measures, to serve as military roads. He mentioned how Marianna, since the roads in its environs were improved, drew trade from 25 to 30 miles away that had formerly gone elsewhere. Tourists go to the east coast now, he declared, because the roads there are better—for the modern tourist comes in his automobile.

Mr. Clarkson, who is chief clerk of the state road department, then read a paper by Wm. F. Cocke, state road commissioner, unable unfortunately to be present. Mr. Clarkson, before beginning the paper, said that, of the \$56,000, Florida's share of the national highway appropriation for this year, most of it was being spent on the Spanish Trail. Oskaloosa county would get \$10,000, Columbia county, \$5,000; Baker county, \$14,000; Nassau, \$3,000; each putting up an equal amount. Next year the Spanish Trail will get \$42,000 of the federal appropriation.

The State Highway Association has logged and mapped upward of 2,000 miles of roads in Florida within the past six months.

Mr. Cocke, in his paper, stressed the importance of building according to the volume of traffic, and advised 30-foot roads. The volume of traffic is to be computed very much as tonnage on a proposed railroad is estimated. To build weaker than the demands require is to lose money on continued repairs; to build stronger, is to make an unnecessary investment. He urged the necessity of state centralization of road building and maintenance in the following words:

In this state the main east and west highway between Pensacola and Jacksonville generally known as the Old Spanish Trail, is approximately 395 miles in length and passes through fifteen separate counties in that distance. If the county is to be the administrative unit the prospect of securing a uniform standard of construction is not encouraging and the prospect of uniform maintenance is so remote as to appear almost a hopeless dream. Not only each county, but each separate district along the line of the road referred to will, under our present system, constitute a separate and distinct unit, each working upon its own individual scheme or maintenance, largely under the supervision of entirely inexperienced and untrained men.

Louisiana Good Roads Association.

The annual session of this convention was held at Shreveport November 3 and 4. Hon. Thomas C. Barret presided at Friday's session in the absence of President P. M. Milner, who failed to reach the city. Following the reading of the report of Secretary William K. Polk, Mayor John McW. Ford welcomed the delegates in an address in which he told of what Shreveport had done in the way of good roads and street construction, and said that it was a real pleasure to welcome good roads boosters to the home of good roads.

W. E. Atkinson, state highway engineer, read an interesting paper on road construction which dealt with the whole question of highway building from the Babylonian era down to the present time. It treated in detail with the efforts made toward highway construction through local, state and national aid.

In detailing the work of the state highway department, Mr. Atkinson said that since it began operations in February, 1911, it has assisted in the construction of 747 miles of good roads in Louisiana, which, when finished, will tax the state highway fund to the extent of \$686,000. To date, he said, 27 parishes have been aided by the state highway department, and if all those who have applied for next year qualify the number will be increased to 37. Application made to the department for construction next year will aggregate 421 miles, he said.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Ohio	Cincinnati	Noon, Dec. 22	Repairing and reconstructing roads	A. E. Reinhardt, Clk. County Comrs.
Ky.	Hazard	Dec. 22	Street paving, cost \$30,000	City Clerk
O.	Matamoras	Dec. 23	Paving several streets with brick	D. R. Bradfield, Clerk.
W. Va.	Pineville	Dec. 23	Constructing 76 miles of earth road	Co. Engr., Mullens, W. Va.
Minn.	St. Paul	10.30 a.m., Dec. 26	Grading and improving several streets	H. W. Austin, Pur. Agt.
Wash.	No. Yakima	2 p.m., Dec. 26	Grading and graveling highway No. 21	C. E. Barrett, Co. Aud.
Ill.	Forest Park	Dec. 26	8,120 yards brick pavement on old macadam base	J. T. Cerney, City Clerk.
Ind.	Gary	Dec. 26	Paving alleys	W. J. Fulton, Engr., City Hall.
Mich.	Detroit	2.30 p.m., Dec. 26	Furnishing stone, gravel and sand, cement and brick	H. A. Gilmartin, Secy. Board of Water Commissioners.
Ind.	Portland	10 a.m., Dec. 27	Constructing stone roads	John Bonifas, Co. Aud.
Cal.	Los Angeles	10 a.m., Dec. 27	Grad., oiling and curb. and constr. brick and coner. walks	Board of Public Works.
N. Y.	Brooklyn	11 a.m., Dec. 27	37,000 sq. yds. asphalt pav't on coner., curbs, sidewalks, etc.; 400,000 gals. liquid asph.; 200 tons refined asph.; 100,000 asph. pav. blocks; 60,000 granite pav. blocks; 6,000 barrels Portland cement; 20,000 sq. ft. bluestone flagging; 13,000 gals. residuum oil; limestone dust, gravel, asph. sand, pav. sand, binder stone and broken stone; 300 tons paving pitch	Bur. of Highways, 50 Court St.
N. Y.	New York	2 p.m., Dec. 27	Constructing concrete sidewalks and laying and relaying flagging	M. M. Marks, Boro President.
Ill.	Chicago	11 a.m., Dec. 27	Cinder sidewalks on many streets	E. J. Glackin, Secy. Bd. of Local Improvements.
N. Y.	New York	10.30 a.m., Dec. 28	Grading, curbing, laying sidewalks, etc.	Douglas Mathewson, Pres. Boro of Bronx.
Ore.	Dallas	2 p.m., Dec. 28	Fencing state highways	Co. Clerk.
N. J.	Riverside	8.30 p.m., Dec. 28	3,300 cubic yards street grading	Lozier, Zabriskie & Van Keuren, Engrs., Bank Bldg., Hackensack, N. J.
Ind.	Anderson	10 a.m., Dec. 28	Seven stone or gravel roads	E. T. Flahavin, Co. Aud.
Va.	Roanoke	Noon, Dec. 28	Five-foot granolithic sidewalks	F. L. Gibboney, City Engr.
N. Y.	New Brighton	Noon, Dec. 29	3,200 sq. yds. granite block repaving, curbing and sidewalks	Engr., Bur. of Engineering.
Ohio	New Concord	Dec. 30	1.5 miles brick or concrete pavement	W. C. Trace, Village Clk.
Ind.	Spencer	2 p.m., Dec. 30	Constructing macadam road	S. M. Royer, Co. Aud.
Wis.	West Allis	Dec. 30	Improving seven blocks	E. G. Orbert, City Engr.
N. J.	Wildwood	Jan. 1	Concrete curbs and gutters; cost, \$20,000	City Clerk.
Ind.	Nashville	1 p.m., Jan. 1	Constructing gravel roads	Omer Morrison, Co. Aud.
Ind.	Brownstown	1.30 p.m., Jan. 1	Constructing tarvia-macadam road	Albert Leudtke, Co. Aud.
Ind.	Greensburg	1 p.m., Jan. 1	Concrete and other roads	J. C. Barbe, Co. Aud.
Ind.	Greencastle	2 p.m., Jan. 1	Constructing five township roads	J. M. Allen, Co. Aud.
Wis.	Fond du Lac	Jan. 1	Concrete pavements; cost, \$20,000	J. S. McCullough, City Engr.
Ind.	Rockport	2 p.m., Jan. 1	Constructing county road	J. Frank Stocking, Co. Aud.
O.	Sidney	Jan. 1	Paving 6 miles of streets	T. Blake, Engineer.
Miss.	Lexington	11 a.m., Jan. 1	19.5 miles highway construction	M. L. Cully, Engr., Jackson.
Ind.	Bloomfield	2 p.m., Jan. 2	3 macadam roads	G. E. Kidd, Co. Aud.
Cal.	Los Angeles	Jan. 2	Grading and constructing oil macadam on 2.76 miles; cost, \$11,000	A. M. McPherrin, Clk. County Supv.
Ind.	Monticello	10 a.m., Jan. 2	Gravel and macadam roads	A. G. Fisher, Co. Aud.
Ind.	Corydon	2 p.m., Jan. 2	Constructing gravel and macadam roads	J. L. O'Bannon, Co. Aud.
Ind.	Logansport	10 a.m., Jan. 2	Township road construction	A. P. Flynn, Co. Aud.
Ind.	Jeffersonville	10 a.m., Jan. 2	Constructing macadam roads	G. W. Stoner, Co. Aud.
Ind.	Vevay	1 p.m., Jan. 2	Constructing township roads	J. W. Smith, Co. Aud.
Ind.	Lebanon	10 a.m., Jan. 2	Constructing county road	Cleve Goodwin, Co. Aud.
Ind.	Bloomington	Jan. 2	Constructing gravel roads	W. F. Kinser, Co. Aud.
Ind.	Lawrenceville	1 p.m., Jan. 2	2,000 feet gravel or macadam road	E. W. Edwards, Co. Aud.
Ont.	Ottawa	4 p.m., Jan. 2	Remodeling asphalt plants	A. F. McCallum, Comr. Wks.
Cal.	Claremont	Jan. 2	Paving with asphalt	City Clerk.
Ind.	Kokomo	10 a.m., Jan. 3	2,685 feet brick pavement	W. L. Benson, Co. Aud.
N. J.	Keyport	Jan. 3	Warrenite paving on concrete base, cost \$65,000	G. D. Cooper, Co. Engr., Red Bank
Ind.	Corydon	2 p.m., Jan. 4	Gravel or macadam road	J. L. O'Bannon, Co. Aud.
Ind.	Monticello	10 a.m., Jan. 5	Constructing county line road	A. G. Fisher, Co. Aud.
Ind.	Green Castle	2 p.m., Jan. 6	Grading, curbing and paving roads	J. M. Allen, Co. Aud.
Iowa	Grundy Center	8 p.m., Jan. 8	Grading, paving and curbing	E. V. McBrown, Town Clk.
Ala.	Moulton	Jan. 8	Five miles macadam road	J. C. Kumpke, Probate Judge.
Ind.	Independence	Jan. 10	Paving 31 blocks, cost \$100,000	City Clerk.
Wash.	Seattle	Jan. 10	Grading and draining two miles of road	C. D. Nims, Co. Engr., South Bend.
N. J.	Freehold	Jan. 10	Five and one-half miles gravel, amiesite and warrenite	Board of Freeholders.
Ind.	Algona	8 p.m., Jan. 11	40,000 sq. yds. first-class pavement, and 40,000 ft. combined curb and gutter	T. S. De Lay, Engr., Creston, Ia.
Ia.	Cedar Rapids	Feb. 1	Paving thirteen blocks; cost, \$90,000	T. F. McCauley, Engr.
Ill.	Cicero	Feb. 1	8,290 sq. yds. asphaltic concrete pavement, and 5,800 feet concrete curb	Lewis Mangreig, Engr.
SEWERAGE.				
Minn.	Olivia	2 p.m., Dec. 22	Constructing tile drainage ditch, cost \$27,690	J. L. Johnson, Co. Auditor
Minn.	Glencoe	Dec. 22	63,600 ft. 8-in. to 24-in. tile drains	County Auditor.
Ky.	Louisville	Dec. 22	84-inch sewer; cost, \$30,000	Board of Public Works.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ia., Cresco	Dec. 22.	17,480 feet tile drains; cost, \$20,000.	E. A. Hoopman, Co. Aud.	
Pa., Erie	Dec. 22.	Constructing storm water sewer system in connection with grade elimination; cost, \$24,112.	F. G. Lynch, City Engr.	
Ill., Quincy	11 a.m., Dec. 23.	Concrete sluice, 360 ft. long, 4x6 ft., and requiring 15 ft. of excavation	W. P. Bushnell, Chief Engr., Wells Bldg.	
Va., Roanoke	Noon, Dec. 26.	Constructing sewers	F. L. Gibboney, City Engr.	
Minn., St. Paul	10.30 a.m., Dec. 26.	Sewers in several streets.	H. W. Austin, Pur. Agt.	
Pa., Allentown	1 p.m., Dec. 26.	Constructing storm water sewers; 9,600 feet 16-inch to 100-inch	C. D. Weirbach, City Engr.	
N. Y., New York	2 p.m., Dec. 27.	Short section of brick sewer	Comr. Pub. Wks., Bureau of Sewers.	
Md., Baltimore	3 p.m., Dec. 27.	Septic tank and iron drains at immigration station	Supervising Archt., Treasury Dept., Washington, D. C.	
Ind., Indianapolis	10 a.m., Dec. 27.	Constructing sewer in alleys	B. J. T. Jeup, City Engr.	
Ga., Columbus	Dec. 28.	Furnishing sewer pipe, sewer brick, castings and other city supplies	M. M. Moore, Clk. of Council	
N. Y., New York	10 a.m., Dec. 28.	Constructing sewers, vitrified and concrete, 12 to 96-inch	Douglas Mathewson, Pres. Boro of Bronx.	
Minn., Farmington	3 p.m., Dec. 28.	Constructing sewer system, including 35,000 ft. 8-in. to 15-in. sewers, pumping equipment and disposal plant	L. A. Whittier, City Clerk.	
N. Y., Long Is. City	11 a.m., Dec. 29.	Constructing vitrified and concrete sewers, 12 to 96-inch	M. E. Connolly, Boro Pres.	
Minn., Red Lake Falls	8 p.m., Dec. 30.	700 feet 8-inch sewer	J. A. Wallace, Engr.	
O., Cuyahoga Falls	Jan. 1.	Sewer constr.; \$60,000 available	E. D. Barstow, City Engr.	
Ill., Rock Island	Jan. 2.	Sewer system and disposal plant	Wallace Treichler, City Engr.	
Minn., Elbow Lake	Jan. 3.	Tile drain, 15 miles long	H. Dunaway, Engr.	
Mo., Higginsville	2 p.m., Jan. 3.	Sewer system and disposal plant	Burns & McDonnell, Engrs., Interstate Bldg., Kansas City, Mo.	
Ia., Burlington	Jan. 4.	Constructing sewers	James M. Bell, Mayor.	
O., Columbus	Noon, Jan. 4.	Sewers in two streets	Chief Engr.	
Wis., Marshfield	3 p.m., Jan. 5.	Sewage disposal plant	J. F. Drauar, Engr., Commercial Bldg., St. Paul.	
Minn., Cambridge	1 p.m., Jan. 6.	Drainage ditch, cost \$13,000	G. S. Smith, Co. Aud.	
O., Cleveland	11 a.m., Jan. 6.	3,100 feet 12 to 24-inch vitrified tile and 20,000 cubic yards drainage ditch excavation	W. A. Stinchcomb, Co. Surv.	
Minn., Gaylord	1 p.m., Jan. 20.	Constructing tile drains, cost \$7,000	Fred Hoppenstedt, Co. Aud.	
Ind., LaFayette	Jan. 24.	8 1/2 miles 8 to 12-inch sewer	E. J. Vaughan, Clerk.	
Minn., Crookston	10 a.m., Jan. 25.	Constructing drainage ditches, cost \$8,000	H. J. Welte, Co. Aud.	
Ill., Cicero	Feb. 1.	1,033 feet of sewers, cost \$2,100	Lewis Mongreig, Engr.	
Ia., Rockwell City	Feb. 5.	Disposal plant; \$10,000 available	F. E. Burnham, City Engr.	
Wis., Chilton	Mar. 6.	Constructing sewer system, cost \$22,000	Jerry Donohue, Engr., Sheboygan, Wis.	
India, Calcutta	2 p.m., June 1.	Storm water pumping plant	C. C. Chatterjee, Sec. Corp. of Calcutta.	
WATER SUPPLY.				
Minn., Duluth	11 a.m., Dec. 22.	Laying water and gas mains	Leonidas Merritt, Comr. Pub. Utilities.	
N. Y., New York	2 p.m., Dec. 26.	Furn., delivering and stor. double-nozzle fire hydrants	Corp. Counsel, Room 2351 Municipal Bldg., Manhattan.	
Md., Indian Head	Dec. 26.	Pumps, pipes, etc., for high pressure system at Naval Testing Station	Bur. of Yards & Docks, Navy Dept., Washington, D. C.	
Mich., Detroit	2.30 p.m., Dec. 26.	12,025 5-8 to 2-inch corporation cocks	H. A. Gilmartin, Secy. Board of Water Comms.	
Pa., Philadelphia	10 a.m., Dec. 27.	Constructing 24-in. and 18-in. c. i. lines, excavating and trenching and constr. concrete reservoir	A. W. McCallum, Sec. 26, South 3d St., Philadelphia, Pa.	
N. J., Atlantic City	Dec. 28.	2,500 g. p. m. centrifugal pump	L. Van Gilder, Engr. & Water Supt.	
Ohio, Columbus	Noon, Dec. 28.	2,000 tons of lime, 1,000 tons soda ash, 150 tons bauxite and 200 tons sulphuric acid	G. A. Borden, Pres. Board of Purchase.	
Pa., Allentown	9.30 a.m., Dec. 30.	Two 6 million gallon pumping engines	C. D. Weirbach, City Engr.	
R. I., Providence	2.30 p.m., Jan. 3.	Stream control work for reservoir	F. E. Winsor, Chief Engr., 661 Westminster St.	
Ohio, Lorain	Noon, Jan. 3.	Six Jewell filters, valves, pipes, etc.	A. J. Horn, Dir. Pub. Service.	
Ind., Ft. Wayne	2 p.m., Jan. 4.	Roof over city reservoir	Board of Public Works.	
Wis., Marshfield	3 p.m., Jan. 5.	Digging well and furnishing pump	J. F. Drauar, Engr., Commercial Bldg., St. Paul.	
Mont., Ft. Keogh	10 a.m., Jan. 6.	Twenty inch centrifugal pump, 125 h. p. oil engine, 550 ft. 32-inch syphon, 8,000 gallon oil storage tank, 3,000 sacks cement, etc.	Quartermaster.	
Ia., Webster City	Jan. 8.	Water and light plant; cost, \$18,000	H. G. Vollmer, City Mgr.	
Ia., Independence	Jan. 9.	Oil engines, pumps, steel tower and tank, reservoir, pumping engine and station, hydrants, valves, pipe, etc.	W. H. Wilson, Mayor.	
Wis., Chilton	Mar. 6.	Constructing water works system, cost \$45,000	Jerry Donohue, Engr., Sheboygan, Wis.	
O., Mt. Vernon	April 1.	Installing meters; \$20,000 available	C. G. Snow, Dir. of Pub. Serv.	
Ill., Gibson City	April 1.	Constructing water and light plant	City Clerk.	
MISCELLANEOUS.				
N. Y., New York	11 a.m., Dec. 22.	Two gasoline motor trucks	Supt. of School Supplies, Park Ave. and 59th St.	
Fla., Jacksonville	10 a.m., Dec. 22.	Canal, 50 feet wide and 6 feet deep	Clerk, Co. Comrs.	
O., Cleveland	noon, Dec. 22.	Sale of steam shovel	Clark Engineer.	
Ind., Kendallville	10 a.m., Dec. 23.	Reconstructing and extending drainage ditches	Curtis Newman, Comr. of Construction	
Ind., Rensselaer	2 p.m., Dec. 27.	Drainage ditch construction, including 169,000 cu. yds. excavation	E. B. Neshitt, Court House	
Ill., Afton	2 p.m., Dec. 28.	Drainage ditches, requiring 200,000 cu. yds. earthwork	Grant Mosher, County Clerk, Sycamore, Ill.	
N. Y., New York	10.30 a.m., Dec. 28.	Draining or filling marshes	Chief Clerk, Dept. of Health, Center & Walker Streets, Manhattan.	
Ind., Lebanon	2 p.m., Dec. 28.	Constructing drainage ditch	D. J. West, Trustee, Marion Township.	
Cal., Whittier	Jan. 1.	Dam and irrigation system; cost, \$750,000. Includes 6,000 feet of tunnel and four miles pipe line or flume	M. N. Hazzard, 217 N. Bright St., Whittier.	
N. Dak., Washburn	2 p.m., Jan. 2.	Three 30 to 60-h. p. gas tractors and two or more graders	E. C. Stocker, Co. Aud.	
Minn., Albert Lea	10 a.m., Jan. 3.	One tractor and two graders	Fred Tavis, Co. Aud.	
N. Y., New York	Jan. 3.	Rock crusher with screen and conveyers	Purchasing Agent, Pan. Canal, 24 State St., New York City	
Ohio, Columbus	Noon, Jan. 4.	Stoker for garbage reduction plant	G. A. Borden, Pres. Board of Purchase.	

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ind.	South Bend	Jan. 5	Comb. patrol and ambu. wagon; \$2,500 available	Board of Public Safety.
Ind.	Huntington	3 p.m., Jan. 5	Constructing drainage ditch	George Hoch, Drainage Comr.
O.	Columbus	noon, Jan. 15	Sale of garbage tankage and grease	G. A. Borden, Pres., Board of Purchase.
Minn.	Henderson	Jan. 17	Constructing two drainage ditches	F. Hoppenstedt, Co. Aud.
Iowa	Rockwell City	1 p.m., Jan. 23	Constructing drainage ditches	R. B. Dixon, Co. Aud.
Minn.	Crookston	10 a.m., Jan. 25	Constructing drainage ditch, cost \$6,000	H. J. Welte, Co. Auditor
South Africa	Johannesburg	Feb. 15	Machinery for utilizing by-products at municipal abattoirs	Municipal Council.

STREETS AND ROADS

Claremont, Cal.—City trustees calls bids for January for paving of First St., between Alexander and College Aves.

Richmond, Cal.—Supervisor Zeb Knott of this city, in company with Chief Engineer G. F. Wilhelm of the People's Water Co., made a trip over the San Pablo canyon road on which \$10,000 is soon to be spent for improvements by the county. Owing to the large area of land to be occupied by the new \$2,000,000 dam of the People's Water Co., it will be necessary for the county to grade an entirely new road to connect San Pablo with the present tunnel road at Walnut Creek.

Sacramento, Cal.—It is reported that Amador County may soon follow the example of Sacramento County in promoting a bond issue for better roads to supplement work to be done by the State Highway Comm.

San Diego, Cal.—Gaps in the State Highway to the east, those unpaved gaps lying within the city limits of East San Diego, La Mesa and El Cajon, may be smoothed over with pavement like the rural stretches, according to plans of officials of the three cities and the San Diego Chamber of Commerce.

Santa Rosa, Cal.—Sonoma County named committees to interest the State Highway Comm. in the building of a lateral from Santa Rosa to the Russian River and the ocean through Sebastopol, Forestville and Guerneville.

Denver, Colo.—The Colorado & Southern railroad has given the necessary real estate south of Washington Park to open and improve Louisiana Ave., between South Franklin and South Race Sts., for street purposes.

Denver, Colo.—Improvement in the state highway and a proposal for the issuance of a \$25,000,000 bond issue one of the outstanding features of the program which Colorado good roads enthusiasts have under consideration for 1917.

Loveland, Colo.—Larimer county plans to surface Greeley-Loveland Rd., part cost to be borne by state highway commission. Address county clerk, Ft. Collins.

Danielson, Conn.—City plans to pave portion main street.

St. Augustine, Fla.—Petition from residents of the Sampson district, asking the commissioners to cooperate with the Duval county commissioners in the construction of a new road connecting with Duval county.

Boise, Ida.—The state highway department will ask the legislature to appropriate \$1,000,000 for good roads in Idaho this winter, was announced by E. M. Booth, state highway engineer. The proposed appropriation would cover a period of two years, giving the department \$500,000 annually for use in road work.

Danville, Ill.—The Illinois Highway Improvement Association met in conference here to plan a comprehensive campaign for a system of good roads that will embrace the entire state.

Lincoln, Ill.—The council has decided to pave several streets with brick. Address City Clerk.

Fort Wayne, Ind.—Plans were ordered for paving Greenlawn and Winter Sts. and for a sewer in the alley between Clay and Warsaw Sts.

Goshen, Ind.—Bids received Dec. 30, 1916, at 10 a. m., by Treasurer of Elkhart county, for sale, \$1,000 highway improvement bonds, 4½ per cent., ten years. W. H. Dinship, Treasurer.

Jeffersonville, Ind.—A \$9,400 issue of Clark County road bonds were sold to J. N. Casady Co., Council Bluffs, Ia., at par, accrued interest and \$400 premium.

Kendallville, Ind.—Engr. Sawyer to prepare plans and specifications for paving Diamond St. from Main to Lake St. at a width of 30 ft.

Shelbyville, Ind.—Two issues of Shel-

by County road bonds—\$9,260 and \$3,880—were sold to the People's Loan & Trust Co., Rushville, Ind., at par, accrued interest and \$175.30.

South Bend, Ind.—Bids were ordered received by the board for the paving of Portage Court.

South Bend, Ind.—Board of public works ordered a resolution to be prepared for the opening of William St., between Colfax Ave. and Navarre St.

Cedar Falls, Ia.—City council to consider paving plans for next year.

Hazard, Ky.—City intends spending \$50,000 for laying curbs, gutters and sidewalks in various streets.

Jenkins, Ky.—Contract will soon be let by city for improving various streets. Estimated cost, \$40,000.

Prestonburg, Ky.—Contracts will be let in January for improving various streets for which bonds have been voted; estimated cost, \$35,000.

Colfax, La.—Election to vote \$300,000 good road bonds. Address Secretary Police Jury.

Attleboro, Mass.—Planning board recommends widening of South Main St. from 27 ft. to 35 ft. from Park St. to Mill St., and extension of Cliff St. to Hayward St.

Boston, Mass.—For improvements along the Charles River, representatives of several cities and towns have organized and will seek immediate action. It is proposed to have the river bed dredged and cleaned, the banks beautified and a boulevard built from Wellesley to a point where it will connect with the present boulevard that runs from Boston through Cambridge and ends near the boundary between Newton and Brighton.

Marblehead, Mass.—Board of Trade considering the proposition for opening a new shore drive from Beacon St. to Lafayette St., near Forest River. The new road would be 2 miles long and would open property along the Naugus Head shore.

Springfield, Mass.—Citizens of Southwestern Massachusetts signed a petition requesting \$50,000 to build a highway between Blandford and Great Barrington.

Springfield, Mass.—Orders were passed for the construction of sidewalks on Orange St., Bristol Ave., Sumner Ave., 10th St., State St., Monmouth St., Northampton Ave., and the laying of curbing on Springfield St.

Bay City, Mich.—The Industrial Works shall pave Saginaw St. from 11th to 12th St., and 11th St. from Saginaw to Water St., including intersections, to be constructed according to plans and specifications approved by the board of public works and council.

Benton Harbor, Mich.—Road bonds to amount of \$100,000 carried at recent election.

Saginaw, Mich.—For paving portion Germana Ave., sheet asphalt, for about \$15,000, Council to let contract in March. H. H. Eymor, City Engr.

Sault Ste. Marie, Mich.—Grading and ditching Second Ave. referred to the streets and sidewalks committee.

Waseca, Mich.—County plans to construct 100 miles of concrete roads to link highways of adjoining counties.

Crystal Springs, Minn.—For concrete sidewalks, city plans to spend \$20,000.

Mankato, Minn.—City Clerk was authorized to advertise for bids for the grading and graveling of a number of the outlying streets of the city.

Waynesboro, Miss.—Board supervisors sold \$25,000 good road bonds.

Missoula, Mont.—Chamber of Commerce pledges its support to the proposition to construct a road from this city to Lewiston, Ida. Forest service may aid.

Albuquerque, N. M.—City soon receives bids for paving portion North 8th and West Central Sts. About \$30,208. E. Ross, city engineer.

Alliance, Neb.—A resolution was adopted in the city at a session of the State Association of Commissioners, Clerks and Supervisors, calling for a regulation which would benefit county roads throughout the state and would amend the present law by giving the board of irrigation and drainage and county commissioners authority to lay out and superintend the construction and maintenance of an intercounty road system.

Omaha, Neb.—The Mitchell Community Club has started a movement to establish a thorough highway up the North Platte Valley, connecting the Lincoln Highway at North Platte with the Yellowstone Highway at Wendover, Wyo.

Omaha, Neb.—James C. Wonders, district engineer of the Fifth district under the new federal road act, is in the city looking for an office location from which to administer the affairs of this road-building program. There are ten federal districts under this act. Nebraska, Iowa, Kansas and Missouri constitute the Fifth district. Appropriation for the building of roads in this district is \$8,500,000. The program contemplates a period of five years.

Atlantic City, N. J.—Residents of Mediterranean Ave. petition city commission for paving.

Burlington, N. J.—An ordinance providing for the issuance of \$10,000 road improvement bonds by the Township Committee of the Township of Willingborough, in the County of Burlington, for paying the whole or a portion of the expense of grading and making shell roads.

Camden, N. J.—The state commissioner of highways has granted the petition of the village board for the paving of Church, Mexico and Main Sts. with bituminous pavement.

Auburn, N. Y.—Resolutions favoring good roads between Auburn and Skaneateles and between Auburn and Port Byron were unanimously adopted by Good Roads Committee of the Chamber of Commerce.

Batavia, N. Y.—Supervisors Coward, Elliott and Miller, the committee from the Board of Finance, Roads and Bridges, made a report of the amount of money required for road work during the ensuing year, amounting to \$75,317, to be added to the audits of the various towns as follows: Alabama, \$5,700; Alexander, \$6,400; Batavia, \$9,000; Bergen, \$4,600; Bethany, \$5,550; Byron, \$5,350; Darien, \$6,450; Elba, \$4,650; Le Roy, \$7,550; Oakfield, \$3,567; Pavilion, \$5,500; Pembroke, \$5,350; Stafford, \$5,650. Of the total amount \$47,317 is for maintenance, \$13,150 for bridges, \$4,750 for machinery and \$10,000 for miscellaneous purposes, removing snow and extraordinary work.

Batavia, N. Y.—Superintendent of Public Works Ebling was directed to make the sidewalk on the south side of Elliott St., between the Central tracks and Liberty St., safe to pedestrians.

Canton, N. Y.—The committee on good roads reported that the county could expect to receive as a result of the motor vehicle law about \$9,000 per year and recommended that in the future this money be divided in three equal parts and be used in improving highways in towns to be designated, those towns being selected that were willing to use some of their own money in addition to this money returned by the state. The Russell-DeGrasse road was suggested, as was the Harrisville-Fullerville and the Rosale-Hammond roads.

Plattsburgh, N. Y.—Board of supervisors approved plans for improvements of two highways in the north part of the county. Section of the Altonia-Chazy highway the state highway department has estimated cost at \$81,000 of which the state's share will be \$68,040 and the county \$12,960. The second road is in the town of Champlain. The section pro-

vided for in the resolution begins at Mooers Corners and runs northerly to the south end of the county highway at the south corporate limits of the village, a distance of 3.34 miles; cost of improvement is \$40,000, of which the state will pay \$33,600 and the county \$6,400.

Newburgh, N. Y.—Favorable action was taken on the report of the good roads committee for various county highways which are to be improved, among them the west Greenwood Lake road, the Warwick Pine Island road, and the road from the Wallkill River to the junction of the Slate Hill-Port Jervis road.

Rochester, N. Y.—One final ordinance was adopted, that providing for South Goodman St. asphalt pavement from Park Ave. to Monroe Ave., at a cost of \$25,300.

Rochester, N. Y.—First ordinances for local improvements adopted were: Oneida St., \$6,600; Garson Ave., \$20,000; Grafton St., \$9,600; Kingsbury St., \$6,000, and Winton Rd., \$26,000. All were for grading, walks and sewer.

Schenectady, N. Y.—Surveys will be made during the winter, if the necessary funds are provided by the legislature, of several of the Schenectady County highways which are on the order of construction. Edwin Duffey, state highway commissioner, has authorized surveys of the following highways: Consaul Rd.-city line-Albany County line, Niskayuna; Mariaville-Montgomery County line, in Duaneburg; Church Rd.-city line-Fisher's Church Corners, Rotterdam; John T. Gifford's Corners on county highway 577-Gifford's Church-Great Western Turnpike, in Rotterdam and Princetown.

Syracuse, N. Y.—Council orders construction of new sidewalks from East Jefferson to South Salina Sts.

Troy, N. Y.—Pomona Grange at Johnsonville indorses movement of a gravel strip of roadway for horses along the sides of improved highways. The Grange decided to appeal to the supervisors, to Albany and to the State Grange to take the subject up and extend it to all improved state highways.

Utica, N. Y.—Supervisors adopt proposed levy on the towns named the following sums, which each town is required to pay for the maintenance and repair of state and county highways for 1917: Annsville, 6.9 miles, \$350; Augusta, 7.58 miles, \$400; Boonville, 9.17 miles, \$450; Bridgewater, 4.67 miles, \$250; Camden, 2.69 miles, \$150; Deerfield, 4.15 miles, \$200; Forestport, 13.33 miles, \$650; Floyd, 2.8 miles, \$150; Lee, 1.33 mile, \$50; Marcy, 15.71 miles, \$800; Marshall, 8.97 miles, \$450; New Hartford, 8.27 miles, \$400; Paris, 5.6 miles, \$300; Remsen, 6.53 miles, \$350; Sangerfield, 4.37 miles, \$200; Trenton, 16.58 miles, \$850; Verona, 2.69 miles, \$150; Vernon, 16.12 miles, \$800; Western, 7 miles, \$350; Westmoreland, 9.17 miles, \$450; total, 153.63 miles, \$7,750. Also to levy on Rome outside the city \$1,100 for the same purpose. The town of Kirkland, with 12 miles of highway, will pay its share, \$600, out of funds which it has on hand.

Watertown, N. Y.—Plans have been completed and a survey made for the widening of the road between Henderson Harbor and Campbells Point.

Yonkers, N. Y.—Resolution approved directing City Engr. to prepare a map and description for the laying out and opening of Marlborough Rd. and Jessamine Ave., from the southern line of Stratford St. to Lockwood Ave.

Burgaw, N. C.—The question of issuing \$100,000 road bonds will be voted shortly by Pender Co.

Winston-Salem, N. C.—Resolution for the paving of 1st St. east of Main, which was adopted.

Wahpeton, N. D.—Paving operations in the business district, petitioned by property owners in the section affected, will be considered by city council.

Cincinnati, O.—The following estimates of improvements will be submitted by the City Engr.: Central Ave., from 4th to Liberty, with wood block, \$111,401; Freeman Ave., from 5th to Kenner, granite, \$85,982.65; Freeman Ave., from Kenner to Central Ave., \$75,664.50, and the sewerage of Park Ave. from Foraker to Lincoln, \$1,010.

Cleveland, O.—For paving and repaving number streets, city receives bids in January for about \$2,500,000. R. Hoffman, city engineer.

Columbus, O.—Ordinance passed paving Hav. Fulton, Macon, Taylor, Bismarck, Kenworthy and Dupont St. H. Maetzl, city engineer.

Cuyahoga Falls, O.—Paving of Hamp-

ton and Telmitch Ave. and Sackett and Newberry Sts. is considered by city.

Fostoria, O.—Commissioners of Seneca and Wood counties are considering the improvement of a 5½ mile stretch of road between Fostoria and Toledo. Wood county is in favor of brick over a concrete base rather than a water bound macadam. The cost of construction of the macadam would be about \$10,000 a mile for a 16-foot pavement, while the brick would cost \$18,000.

Hamilton, O.—City council ordered repaving of High St.

Montpelier, O.—City making plans improving streets. G. Champe, Engr., Toledo.

Ravenna, O.—City receiving bid in December for paving portion Lake Ave. W. H. Linton, city engineer.

Salem, O.—Paving is considered by Board of Public Service; B. M. French, City Engr.

Tiffin, O.—Seasongood & Mayer, Cincinnati, Saturday were awarded a \$45,000 issue of Tiffin St. improvement bonds at a premium of approximately \$1,700.

Toledo, O.—Legislation for improvements which will cost more than \$500,000 was approved by the public improvements committee of the council, to include the paving and repaving of 33 streets, 11 alleys and the construction of nine sewers.

Oklahoma, Okla.—For \$800,000 road bonds no sale was made on account of injunction proceedings. C. W. Goree, Clerk County Comrs.

Tablequah, Okla.—To vote \$100,000 road and bridge bonds, an election will be held Dec. 22.

Waurika, Okla.—Jefferson county to vote on \$27,000 bonds to improve roads Dec. 27.

Dalles, Ore.—Wasco county's \$260,000 of 5 per cent. highway bonds will be offered for sale Jan. 6.

Portland, Ore.—John B. Price & Co., of Seattle, who bought \$180,000 of street improvement bonds from the city Nov. 23 at the highest premium ever paid for such bonds in the Pacific Northwest, are offering them to investors. The block of \$85,000 of bonds dated Jan. 1, 1913, will mature Jan. 1, 1921, City Treas. Adams is quoted, and are offered at 105.75, yielding 4½ per cent. The lot of \$95,000 taken by the Seattle investment bankers is dated Oct. 1, 1916, and estimated to be redeemable in nine years. They are offered at 110.20, at which price they will yield investors 4.3-5 per cent for the entire period. The bonds pay 6 per cent yearly.

Warrenton, Ore.—Over \$17,000 recently voted to hard surface main county road through town.

Beaver Falls, Pa.—Announcement of plans for the immediate improvement of Route No. 77 from New Castle, Moravia and Wampum to this place, was received with interest. This is a statement of Comr. of State Highways Frank B. Black and Chief Engr. Uhler. It is also stated that Wampum will spend about \$15,000 in the paving of its main street to complete the link in the chain of improved highways.

Nanticoke, Pa.—City contemplates paving portion Ridge St. D. Samuels, Engr.

Wilkes-Barre, Pa.—Specifications for the paving of 19 streets are being prepared by City Engineer Bert Finch. It is planned to advertise for bids. Most of the streets are to be paved with asphalt, the total yardage being 50,000 sq. yds. The following is the list of streets to be paved: Empire St., Market to Northampton St.; Madison St., Derr line to Maple St.; Sherman St., Market to Coal St.; Fulton St., Market to Puritan lane; Meade St., Market to Coal St.; Ruddie St.; Solomon St.; Waller St.; Franklin St., Kulp to Elm St.; Lawrence St., Carey Ave. to Plymouth Ave.; Oak St., Willow St., Simpson St., Carlisle St., Sturdevant St., Beach St., Poplar to McLean St.; Brook St., Barney to Waller St.; Stark St., Carlisle to Carey Ave.

Alton, R. I.—The Town Clerk was instructed to obtain price of different sizes of trap rock to be used on the Alton Highway.

Woonsocket, R. I.—For about \$78,000 council plans to pave East School St. and build 2 bridges. F. H. Mills, City Engr.

Charleston, S. C.—The committee on streets referred the petition of Hampton Park Terrace residents for continuing Elmwood Ave. to the park to the city engineer.

Sumter, S. C.—City council ordered an election to issue \$75,000 paving bonds.

Centerville, Tenn.—County sold \$225,000 road bonds.

Hohenwald, Tenn.—Election for road bonds to amount of \$100,000 carried.

Murfreesboro, Tenn.—East and West Main Sts. and the block on College St., between Maple and Church, may soon be paved.

Austin, Tex.—The Attorney General's Department approved the following bond issues: City of Taylor, permanent improvement, \$50,000; Montgomery county road district No. 4, \$5,000.

Dallas, Tex.—The city has ordered the paving of Lamar St., from Commerce St. to Forest Ave., the work to start soon after Jan. 1.

McKinney, Tex.—For 1½ miles paving city will soon let contract.

San Marcos, Tex.—Bonds of \$75,000 to build roads Buda Precinct. Hays county plans election Jan. 6. Address county clerk, San Marcos.

Alexandria, Va.—A vote was taken in Alexandria county, Va., on a bond issue, amounting to approximately \$300,000, for permanent roads in that section of the Old Dominion. The county is divided into three districts—northern, central and southern districts. The northern district, or what is known as Washington district, voted in favor of the proposition, and as a result was bonded to the extent of \$125,000. This will take in the suburban section from Cherrydale to Falls Church. In the Arlington or middle district the bond issue lost by 28 votes. The bond issue was for \$175,000.

Richmond, Va.—City Engineer Bolling submitted a report showing an estimated cost of \$3,321.95 for laying granolithic curb and gutters and grading and graveling the roadbed and sidewalks on both sides of Chaffin St., from Addison to Davis Ave.

Charlottesville, W. Va.—Representatives of Huntington and Charlottesville Chambers of Commerce will meet in Hurricane, Putnam County, with citizens of that town and the surrounding community who are interested in the improvement of public roads, to receive a report from a committee appointed to devise a plan for constructing several miles of road in Putnam County.

Lewistown, W. Va.—The election defeated the proposition to issue road bonds; \$121,000; Jno. S. Crawford, Co. Clk.

Brighton, Wash.—Residents have petitioned for grading, curbing, etc., on Eddy St., Angel and Espey St., between 38th south from Holly to Graham Sts.

Dayton, Wash.—A good roads meeting held recently. Resolution passed asking that \$6,000 unused funds be apportioned for extension of road north of Walla Walla.

Spokane, Wash.—The construction of a highway over top of Mount Spokane, connecting with a private road and completing a route from city to Spirit Lake, to be known as Sam Hill highway, will be proposed to next legislature if plans under way materialize.

Spokane, Wash.—Although the contract was let, Mayor Fleming and Commissioner McBroom changed plans Nevada grading. The council ordered new plans for the grading of Nevada from Rowan to Euclid and on Euclid from Nevada to Hamilton.

Seattle, Wash.—Bids opened by county commissioners Jan. 16 for the purchase of \$500,000 in road bonds of \$3,000,000 issue of three years ago.

Seattle, Wash.—For construction of Geo. E. Sylvester road, bids are called for January.

Dodgeville, Wis.—Two hundred miles highways considered by Iowa County. R. W. Gribble, Dodgeville, Aud.

Milwaukee, Wis.—Ordinance to permanently establish the grade on the alley running northwesterly and southeasterly through block 26, Lake Side Park No. 4.

Munston, Wis.—Public improvement bonds of \$25,000 authorized by common council.

Mondovi, Wis.—To vote \$40,000 road bonds an election will be held in the near future.

Monroe, Wis.—Concrete road from city to county farm. Green County plans about 3 miles. Address County Clerk, Monroe.

Milwaukee, Wis.—Ordinance to permanently establish the grade on the alleys, Block 2, Forest Lawn, between 39th, 40th, Vliet Sts. and Hillside Lane.

Stevens Point, Wis.—Portage county plans trunk system highways. A. E. Bourn, Stevens Point, auditor.

London, Ont.—Authorizing the raising of \$32,000 for good roads, Middlesex county council passed a by law. Chas. Talbot, C. E., London County Road Supt.

Perth, Ont.—For construction of a roadway between Perth and Smith's Falls at cost of \$21,000, the Provincial Government and the municipalities of Perth, Smith's Falls and township of North Elmsley have under consideration.

Toronto, Ont.—The works committee decided to lay a bitulithic pavement on Davenport road, from Bathurst St. to Christie St., at a cost of \$32,527, and from Christie St. to the Grand Trunk tracks, at a cost of \$144,180.

St. Vital, Man.—For 5 miles of concrete road, with a 3-span reinforced concrete bridge, Municipal Council are having plans prepared; cost, \$5,000. Engineer, M. T. Cantell.

Winnipeg, Man.—A site for an 11-mile wagon road to serve the Herby Lake mines, near The Pas, Man., has been located by H. Gordon, civil engineer. Estimated cost, about \$10,000.

Quebec, Que.—For colonization roads, the Provincial Government voted \$250,000; Minister of Roads, Hon. J. A. Tessier.

Victoria, B. C.—Construction of a 12-ft. macadam trail on Madison St. from Cowan Ave. to Quamichan St., and on Quamichan St. from Foul Bay road to Richmond road, cost \$1,350. C. H. Rust, City Engineer.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Bay Minette, Ala.—For improving portion State Trunk Rd. No. 12, Baldwin County, let to *J. G. Brown, Montgomery; \$3,000.

Centerville, Ala.—For portion Centerville-Randolph Rd., Bibb county, let contract to *P. H. O'Brien, Birmingham; \$10,000.

Berkeley, Cal.—City Council, for the paving of University Ave. from Grove St. to West St. and from West St. to Third St., to *G. T. Covault of Stockton; \$62,205.69, which will amount to from \$4.75 to \$5 a front foot, including engineer's fees and other expenses.

Los Angeles, Cal.—Bd. of Pub. Wks.: Agatha St., between Gladys Ave. and Towne Ave., shall be improved by the construction of concrete pavement, cement curb, concrete gutter, and all other work or improvement described. *Ford & Stout, at the prices named: 13 cts. per sq. ft. for concrete paving, Specifications No. 101; 2 cts. per sq. ft. for grading to sub-grade, Specifications No. 101; 30 cts. per lin. ft. for cement curb, Class A, Specifications No. 88; 12 cts. per sq. ft. for concrete gutter, Specifications No. 91.

Los Angeles, Cal.—*John Sutalo: 15% cts. per sq. ft. for concrete gutter, 34th St. from the westerly line of University Ave. to the easterly line of Hoover St.

Pasadena, Cal.—*J. E. Haddcock, Pasadena, concrete paving without oil coating 5 ins. thick, \$9.48 paving per sq. ft., amount \$4,733.52. Bidders: T. C. Breitenstein, Pasadena, \$9.68 paving per sq. ft., \$4,890; H. E. Cox, 10c. paving per sq. ft., \$4,635.72.

Whittier, Cal.—*Municipal Improvement Co., 803 Macdonald Ave., Richmond, for paving Brigat Ave.

Augusta, Kan.—City let *C. L. Besler Construction Co., Winfield, paving State St. and 5th Ave.; about \$66,091.

Owensboro, Ky.—On a bid of \$174,706 the *Montgomery Perkins Co., of Hopkinsville, for constructing about 21 miles of road in Daviess county.

Lake Charles, La.—Lawrence St. from Ryan to Front Sts., vertical fibre brick pavement. *De Jersey & Naff, of Opelousas, La., \$2.20 yd. Bidders: Knapp & East, of Lake Charles, La.; Warren & Boyd, of Lake Charles, La.; Ritchie Bros., Topeka, Kan. Andrew Cook, city clerk.

Lake Charles, La.—Boulevard St., let Nov. 9, 1916, for gravel pavement. *De Jersey & Naff, Opelousas, La., for 70 cts. per sq. yd. Bidders: Healy Construction Co., Meridian, Miss.; Perry & Bonner, New Orleans, La.; Ritchie Bros., Topeka, Kan. Andrew Cook, city clerk.

Baltimore, Md.—For concrete highway, contract 15, Worcester county. *Major Construction Co., Pocomoke, Md., at \$40,000; contract 15, Wicomico county. *Burgess & Darrie, Scottsville, Va., at \$40,000. State Roads Commissioners, F. H. Zouck, Chm., 601 Garrett Bldg., Baltimore, Md.

Canton, Miss.—*Owens Construction Co., Madison, Wis., for 40 miles earth roads, including 126,000 cu. yds. earth excavation in Madison District, Miss. Walter G. Kirkpatrick, Engr., Birmingham, Ala.

Moss Point, Miss.—For paving with

ground shell and oiling 5 miles of road west of this city to *Jett-Muths Construction Co., Mobile, Ala.

Albuquerque, N. M.—For paving Central Ave., to *J. B. Laughlin, Trinidad, Colo.

Jersey City, N. J.—*McCabe Bros., 1205 Blvd., Bayonne, by Hudson county parental board, road leading to Parental Home, \$6,897.

Bellevue, N. C.—*W. S. McCrady Co., Charleston, S. C.; city let contract 1½ mile sidewalks; about \$6,000.

Ashtabula, O.—*Thomas P. Fitzgerald, paving, draining and curbing. \$14,180. Main St., Mill Hill to Ashtabula River, Medina stone and grout filler, concrete base, 6 ins. thick. Engr., Lewis A. Amsden, City Hall. A. T. Faulkner, City Clk., City Hall.

Fremont, O.—By Huron county commissioners to the *Modern Construction Co., of Fremont, for the Medina road Inter County Highway 391, at \$98,807.55.

Medina, O.—*Cradford & Little, Elyria, O., for one mile concrete on Barborton-Greenwich road and 1,000 ft. concrete on N. Homer Spencer road. W. F. Peters, Engr., Court House, Medina. Comrs. of Medina Co., Geo. McNeal, Aud.

Piqua, O.—*J. M. Hennessy & Bros., paving portion Washington Ave.; curbing to *Ziegler & Snyder. Let by city.

Wilmington, O.—*Bean & Co., Highland, O., at \$20,849, for 5.02 miles water-bound macadam paving in Sec. 9, Wilmington-Hillsboro Rd., Green Twp., Wilmington State Highway Dept.; Clinton Cowen, Comr., Columbus, O.; Harry Gaskill and Clinton County, Wilmington.

Youngstown, O.—*Mullen & Quinn, 463 E. Federal St., Youngstown, O., paving with brick Alice St., 1,070 sq. yds. concrete foundation, 5 ins. thick, including 395 cu. yds. earth excavation, \$2.10 paving per sq. yd., 45 cts. excavation, total \$294,905.

Youngstown, O.—Paving Green St., brick, 1,240 sq. yds., concrete foundation, 5 ins. thick, including 800 cu. yds. earth excavation, *H. A. Miller, 35 N. Rebeca St., Youngstown, O., \$2.04 paving per sq. yd., 54 cts. excavation, amount \$3,455.30.

Youngstown, O.—For paving with brick Oak Hill Ave., 2,550 sq. yds., concrete foundation, 5 ins. thick, including 700 cu. yds. earth excavation, *S. H. DeGroot, 127 E. Woodland Ave., Youngstown, O., \$2.15 paving per sq. yd., 60 cts. excavation, total \$6,133.75.

Philadelphia, Pa.—Bids were received Dec. 19 on work valued at approximately \$191,700. The estimated costs of the several characters of work are as indicated: Schedule "A," grading, estimated cost \$101,000; "B," paving, asphalt, \$7,200; "C," repairing and patching asphalt streets, \$75,000; "D," repairs to Delaware River bank, Delaware county, \$1,500; dredging creeks 40th Ward, \$7,000. The bids are being scheduled and the low bidders will be known within the next few days.

Benton, Tenn.—Highway over Appalachian Mountains. *Riley-Ryan Co., Chattanooga, \$62,500. B. Polk county.

Mount Pleasant, Tex.—For grading, curbing, guttering, claying and graveling one mile of streets to *General Construction Co., Fort Worth, at \$24,574.

St. Albans, Vt.—Repairs to sidewalks at U. S. P. O., *Frank F. Shore, at \$1,000.

Wheeling, W. Va.—*Ball Engineering Co.; county let contract 5 miles road; \$40,000.

Victoria, B. C.—*Phillips Stone Works at \$1.85 and \$2.35 a sq. yd., for the granite sets for the Yates St. paving.

Toronto, Ont.—*R. R. Harris, commissioner of works, for construction of an asphalt pavement on Hastings St., at \$7,627.12.

Toronto, Ont.—For construction of concrete sidewalks by board control to *Constructing & Paving Co., at \$1.04½ per lin. ft., and to *R. C. Harris, commissioner of works, at \$1.08.

SEWERAGE

Birmingham, Ala.—Ordinance adopted to provide for the construction of certain sanitary sewers.

Waterbury, Conn.—It was voted to recommend to the Bd. of Aldermen that the construction of a storm water sewer on Thomaston Ave. be done by the city under the supervision of the engineering department as it is believed it can be built at less cost by the day than by contract.

St. Petersburg, Fla.—Sewers and disposal plant. City plans to vote on \$150,000 bonds.

Cairo, Ga.—Nov. 28th election to vote \$28,000 sewerage system bonds has been indefinitely postponed on account of an error in advertising the bond election. J. H. Connell, City Clk.

Columbus, Ga.—Mayor John C. Cook in his annual message to council recommends a bond issue for raising funds for the construction of a sewer on Cook's branch.

Orofino, Idaho.—City Council has accepted the plans, specifications and estimates of Sawyer Bros., of Spokane, for a sanitary sewer system. It is proposed cost is approximately \$35,000.

Fort Wayne, Ind.—See "Streets and Roads."

Fort Wayne, Ind.—Improvement resolutions were approved for three local sewers in Nebraska, as were one for a sewer between Piqua and Barr, one in the alley north of Rudisill Ave., from Beaver to Indiana; one in the alley between Superior and Columbia, from 150 ft. west of Clay St. to 70 ft. east, and one near Barthold and High Sts.

Sioux City, Ia.—City plans West Morningside and North Riverside sewer system. T. H. Johnson, city engineer.

Biddeford, Me.—Council voted extension of South St. and Western Ave. sewers.

Beverly, Mass.—An order providing for the construction of a sewer on Oxford Terrace at an estimated expense of \$350, was referred to the finance committee.

Lawrence, Mass.—City Council ordered, for the purpose of constructing sewers for sanitary and drainage purposes in the city, an additional city debt be created, to be known as the "Supplementary Sewer Loan of 1916," and the City Treasurer authorized and instructed to prepare and sell bonds of the city to the principal amount of \$7,000.

Springfield, Mass.—Order for a sewer on Athol St. passed.

Brown, Mich.—Sewer system is considered by city. L. A. Bowlay, 1250 Nicholas Bldg., Toledo, O., Engr.

Gladstone, Mich.—At a special election the proposal to issue bonds in the amount of \$14,000 for the construction of a new sewerage service in the Upper Bay City, passed.

Northville, Mich.—A disposal plant and sanitary sewers considered by city. C. W. Hubbell, 2338 Penobscot Bldg., Detroit, Engr.

Sault Ste. Marie, Mich.—Vitrified salt glazed sewer pipes will be installed as follows: 12-in. on Magazine St., Portage to Spruce; 15 and 20 inch on Portage, Douglas to Magazine, and on Ashmun, Peck to Portage.

Duluth, Minn.—Petition for the construction of a sanitary sewer was filed with City Clerk Borgen as follows: In 64th alley West from Green St. alley south to Bristol St. and from Roosevelt St. north to Bristol St., with an outlet in Bristol St. from 64th to 63d alleys West.

Leroy, N. J.—City plans sewer system; J. P. Wells, Rochester, Consulting Engr.

Pasadena, N. J.—Union township commissioners considering bids for a sewer disposal plant in the Kingsland section of the town, the sewerage from which section cannot be drained into the Pasaden Valley trunk sewer. Two lowest bids: Able Mathews & Co. for \$14,400 and H. K. Cordon for \$16,490, both from Jersey City; were held back and the others returned. The contract will be awarded on Dec. 18.

Trenton, N. J.—City plans disposal plant at Buttonwood Island.

Auburn, N. Y.—Sewer bonds \$1,866.90 authorized by common council.

Binghamton, N. Y.—Contracts for trunk sewer on south side of Susquehanna River and river crossing will be let in the spring. W. Earl Weller, City Engr.

Brooklyn, N. Y.—Local board of aldermen for the Heights district favored petition for construction of sewer in Hamilton Ave. from Rapelyea St. to Ferry place through to Sackett and along Sackett St. to the river.

Yonkers, N. Y.—City Engr. Fulton submitted plans and specifications for a house sewer in Grant Ave.; also a storm water sewer in Iselin St.; referred to Com. on Pub. Wks.

Cincinnati, O.—A resolution declaring it necessary to improve by sewerage the north sidewalk on Queen City Ave., from existing trunk sewer east of Richter Ave. westwardly 760 ft.

Cincinnati, O.—See "Streets & Roads."

Crestline, O.—Sewers in portion of Bauer Ave. and South Selzer St.; ordinance passed by Council. C. N. Babst, Mayor.

New Bremen, O.—Service in portions of Herman St. considered by city.

Springfield, O.—Ordinance passed by council for sanitary sewer in portion of High St. M. J. Bahin, City Engr.

Toledo, O.—See "Streets and Roads."
Broken Arrow, Okla.—For about \$30,000 city making plans: 26,000 ft. 6-in., 12,000 ft. 8-in., and 800 ft. 10-in. sewer pipe and two disposal tanks; Mackintosh, Walton Co., Oklahoma, City Engr.

Drumright, Okla.—See "Water Supply."

Kendall, Okla.—The city will issue \$50,000 sewer bonds. Address C. W. Johnson, Chairman of the Board.

Ponca City, Okla.—The city voted \$30,000 bonds to construct a sewer system and water works. Address the Mayor.

Sapulpa, Okla.—Bids received by city in January for storm sewers. R. E. Jeanes, city clerk.

Johnstown, Pa.—Plans for an activated sludge system for sanitary sewage treatment, demanded by the State Health Dept. for use in case the screening system that will be established by the city becomes insufficient with the passing of years; will call for the purchase of about an acre of ground lying between land already acquired by the city for the erection of a sewage disposal plant and the Johnstown & Cramer Turnpike. Sanitary Engr. C. P. Collins and his staff have nearly completed the sanitary sewer system plans demanded by the State, and will have them done by the first of the year.

Pittsburgh, Pa.—Ordinance improving sewers portion Reedsdale St. passed by Council; R. Swan, City Engr.

Reading, Pa.—Disposal plant considered by city for about \$95,000. E. Ulrich, City Engr.

Wilkesburg, Pa.—Council passed an ordinance for the issuance of \$150,000 of bonds to liquidate a floating debt contracted through the elimination of grade crossings, paving improvement and the erection of a sewage disposal plant.

Kingsport, Tenn.—Kingsport Sewer Co., Kingsport, capital stock \$50,000; incorporators: J. Fred Johnson, J. C. Stone, W. W. Hubbard, D. R. Pierce and F. E. Martin. To construct a system of sewers in Kingsport.

Bryan, Tex.—For about \$15,000, city plans disposal plant.

Dallas, Tex.—To build storm sewers, city plans to vote \$300,000. H. Moseley, city engineer.

Roanoke, Va.—Bids called for in December for sewers. F. L. Gibbonney, city engineer.

Sumner, Wash.—Plans are being prepared for extending a sewer system. Address City Engr. W. P. Ware.

Winnipeg, Man.—Plans and specifications with City Engineer W. P. Brereton, 223 James St. Henders will shortly be called on the construction of sewers and water mains on Academy road. Cost, \$6,000.

Halifax, N. S.—The extension of sewer and water mains on Beech St. was decided by city council. H. Johnston, Assistant City Engr.

Halifax, N. S.—Acting City Engineer H. Johnston has recommended that plans and specifications be prepared and tenders called for part of the work in connection with the North West Arm sewer proposition. Also for several other sewers.

Smith's Falls, Ont.—For the town council the provincial board of health has approved the plans for the proposed sewer and water mains on Atterton St.; will necessitate about 3,500 ft. of vitrified sewer pipe and same of cast iron pipe. S. B. Code, Engr.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Long Beach, Cal.—*Tomich & Jaeger, 553 Pacific St., \$37,000, sewer district No. 3.

Los Angeles, Cal.—Pub. Wks.: Vit. pipe sanitary sewer constructed in Alta St. and Mission Rd., from a point 3.34 ft. northwesterly from the center line of Mission Rd. to the easterly prolongation of the center line of Park Heights Ter., *Andrew Jaylich; \$381.

Fayette, Ia.—*Comstock & Hanson, Oelwein sewer system, \$17,000. Engr., G. H. Bishop, City Hall, Oelwein, Ia. F. H. Claxton, City Clk., Fayette.

Hagerstown, Md.—*R. Conner & Son, Greensburg, Pa., 54-in. sewer, 1,100 ft. tunneling; \$70,860.

Mankato, Minn.—*Ludin Bros. for the excavation and installing of the sewer on North Front St.; \$5,545. For the water mains along the same frontage,

*John McCall, \$2,200. Bids received as follows: Lundin Bros., excavation and laying of the sewer, \$5,545, and both the laying of the water and sewer, \$7,900. E. J. Hottinger, excavation and laying of the sewer, \$7,675; water mains, \$2,300. Widell Co., sewer and water complete, \$10,930. A. Bashaw, excavation and laying of sewer, \$7,700; water mains, \$2,800. T. R. Coughlan Co., complete, \$11,147. John McCall, sewer and excavating, \$9,450; laying of water mains, \$2,200.

Winthrop, Minn.—For water works and sewerage system, 75,000 gallon tank, tower and pump house to *Gaylord Hardware Co., Winthrop.

Passaic, N. J.—Union township commissioners let the contract for the entire sewer system construction to *C. S. Edwards & Co., of Jersey City, for \$253,878.26.

Johnson City, N. Y.—*G. Serafini, 10 Lafayette St., Binghamton, by city for sewer in portion Floral Ave.

New York, N. Y. (Manhattan).—*Laconia Constructing Co., 835 East 213th St., Bronx; sewer in portion Spruce St. Boro. Pres., Municipal Bldg.

Rochester, N. Y.—For a sewage pumping plant on the ejector system, which will take care of the sewage for the district on the upper side of Highland Ave., on the right hand side of the Monroe Ave. intersection. *Ernest Kuhs for \$3,912.

Mansfield, O.—Sewers as follows: Lillie and Raymond Sts., *C. H. Au & Son, \$1,335; Harker St., *Dominic Micheles, Canton, O. W. J. Hazelton, City Engr., Mansfield, Dept. of Pub. Service, Ora Hirsch, Director.

Tiffin, O.—*Fred Kretzer, for 675 lin. ft. sewer in Grace St. Dept. of Pub. Service, W. Heller, Director.

Stillwater, Okla.—*Theo. Cudgel, at \$9,550, sewer system improvements. S. W. Burr, Mayor.

Philadelphia, Pa.—*David McMahon, Main and Chelton Sts., Philadelphia, by board of public works, sewer in Germantown Ave., \$46,495.

Charleston, S. C.—For the laying of sewers and the construction of a pump pit was let to the *Simons-Mayrant Co.

Quannah, Tex.—For constructing sewer system and disposal plant to *Winslett Eldridge, Dallas, at \$24,358. R. H. Spiller, City Engr.

Salt Lake City, Utah.—The Salt Lake Union Stockyards to *John L. Griffith of 1145 Browning Ave., for a 3,300-ft. sewer line from the stockyards to the Cudahy Packing Plant.

Salt Lake City, Utah.—For construction of the pumping plant to be operated in connection with the new gravity outlet sewer, to the *Lynch-Cannon Engineering Co., \$18,625.

WATER SUPPLY

Bakersfield, Cal.—Election in East Bakersfield defeated proposition to issue water works bonds of \$75,000.

Colorado Springs, Colo.—Geo. P. Anderson has completed survey for water system. A bond issue of \$500,000 is needed for improvements. Address City Clk.

Colorado Springs, Colo.—Improvement necessitating the expenditure of approximately \$750,000 were recommended by George G. Anderson, Los Angeles, hydraulic engineer, who has been making one of the most exhaustive surveys of the water system ever undertaken. The principal change recommended is the introduction of water meters, which will cost about \$150,000, but which would work toward the conservation of the water supply; also the construction of a new reservoir for \$75,000, the replacing of small mains with larger ones, the installation of 30 more fire hydrants, the use of shorter routes for piping and various repairs.

Caldwell, Kan.—Bond election has been called for Jan. 23 for \$80,000 bonds for improvements to the water works and lighting plant, including new water supply from wells. Burns & McDonnell, Consult. Engr., Kansas City, Mo.

Bossier, La.—Bossier City and Logansport are arranging to build water works. Plans and specifications for both towns are being drawn by Honaker & Swope and bonds will be issued. The Bossier plant of 75,000 gallons will cost \$10,000. The Logansport plant will cost \$20,000.

Holyoke, Mass.—Recommendations estimated to cost about \$40,000 are made in the report of Engrs. Frederic P. Stearns and William S. Johnson of Boston on the construction of the dam at the White Storage Reservoir.

Pittsfield, Mass.—The orders for a water main extension to Swamp road and Barker Ave. and the order appropriating \$3,500 for rifle range were referred to the city council.

Sault Ste. Marie, Mich.—Extending water main on Second Ave. from Tenth St., a distance of about 600 ft., referred to the water works committee.

Sault Ste. Marie, Mich.—Cast iron water mains, 8 in. size, will be installed on Portage Ave. between Douglas and Magazine Sts.; also on Magazine St. between Portage and Spruce, and on Ashmun, between Portage and Ridge, and 12-in. pipe on Maple, between Ashmun and Court.

Duluth, Minn.—Bids on laying the large parallel water supply main from the 34th Ave. east reservoir will be advertised shortly.

St. Paul, Minn.—The report of E. R. Townsend, inspector for the Natl. Board of Fire Underwriters, has reached Mayor Irvin and Comrs. Keller and McColl. Recommendations for improvements are made as follows: Improvement of water distribution system to provide higher pressure in the southwest portion of the city. Installation of 30-in. main in Mississippi St. between Cuyuga and Grove Sts. A systematic study of fire-fighting in various districts with relation to the manner in which fire should be fought, the positions companies should take and the hydrants that can be used to best advantage.

Richmond, Mo.—The city contemplates the construction of a water filter and extension to mains, etc., and will vote early in the spring on about \$20,000 bonds. J. L. Farris, Jr., Mayor.

Sedalia, Mo.—Burns & McDonnell, consulting engineers, Interstate Bldg., Kansas City, Mo., has been retained by this city to make an appraisal of the water works plant with a view of municipal ownership; plans and estimates for improvements in case of purchase; plans for entire new plant with new water supply. Bond election will not be called for about 60 days.

Stanberry, Mo.—The city will construct six miles of water works extensions and will soon let the contract. Address C. A. Greenlee, City Clerk.

Newark, N. J.—Anton L. Petterson, recently retained by West Orange, was instructed by the water committee of the town council to cooperate with the Commonwealth Water Co. in the preparation of a tentative contract, which will probably be presented to the council. The contract, it is proposed will be for ten years and the present contract, which would expire in 1918, will be abrogated. The engineer was also instructed to make sketches of changes to be made in the pipe lines so as to provide an adequate supply of water.

Herkimer, N. Y.—The clerk was directed to make application to the conservation commission for the construction of the new water system, including the appropriation of land and laying of the pipe line.

Watertown, N. Y.—The 99 years' lease of the municipal water power plant proposition will be placed before the common council.

Cleveland, O.—Resolution by board of control bids received Dec. 6 for core borings of walls, roof and floor of filtered water reservoir for filtration plant are rejected.

Checotah, Okla.—City council considering constructing water works.

Crescent, Okla.—City considering constructing water works and sewer system.

Drumright, Okla.—The local city council has passed an ordinance authorizing the calling of a municipal bond election to issue \$43,000 in bonds for the water works extension, \$16,000 for the purchase of equipment for the fire department, \$16,000 for a city hall, and \$25,000 for storm sewers and culverts.

Norman, Okla.—\$10,000 in bonds have been voted to improve water system. Address J. M. Wise, City Clerk.

Franklin, Pa.—City rejected bids for reinforced concrete pump well. J. G. Crawford, City Clk.

Charleston, S. C.—Canvassers have been appointed by the committee on water supply of city council to get the signatures of freeholders to petitions asking for an election to decide whether the city will purchase the plant of the Charleston Light & Water Co. for \$1,560,000.

Castlewood, S. D.—Plans are being made for constructing water works system, including mains, tower and pumping station, to cost about \$20,000. Freed & Sours, Inc., Engineers, Watertown, S. Dak.

MISCELLANEOUS.

Springfield, Tenn.—Jan. 6th the question of issuing \$36,000 water works bonds will be submitted to vote. Address City Clerk.

Dallas, Tex.—Propose meters for fire lines estimated cost would be \$100,000. Fire lines in all of the larger cities of states composing the Southwestern Waterworks Association will be equipped with meters if a movement on foot toward this end is successful. An effort will be made at the annual meeting of the association at Topeka, Kan., in June to secure the adoption of the fire line meter plan.

Fort Worth, Tex.—Water Comr. Crabtree will immediately request City Engineer Von Zuben for specifications and estimates for the proposed enlarging of the settling basin and filter plant. The improvement may be undertaken by January and will require about two months to complete. The total cost will run about \$60,000.

Fort Worth, Tex.—The city plans to double the capacity of the filter plant. Its present capacity is 5,000,000 gallons, to cost about \$50,000. F. J. Von Zuben, City Engr.

Farmville, Va.—The city will issue \$15,000 water works bonds and expend this amount on plant of 1,000,000 gallon capacity, and install turbine and electrically operated pumps. Address City Clerk.

Richmond, Va.—Superintendent Davis of the water department authorized by administrative board to contract with the Wallace & Tierman Co., Inc., of New York, for a pilot intensified and two automatic control type Behlorinators, to cost not more than \$2,300, to be used in purifying system at the settling basins.

Walla Walla, Wash.—The State of Washington was the successful bidder for the funding water bonds of \$338,000. M. A. Power, City Clerk.

Vancouver, B. C.—To cost about \$1,550.10, the water works committee authorized the purchase of a 10-in. Protectus water meter.

Winnipeg, Man.—See "Sewerage."

Halifax, N. S.—See "Sewerage."

Tilbury, North Twp., Ont.—Council passed a by-law to raise \$6,320, Nov. 30, for the construction of a pumping system and \$741 for improving a drain. J. A. Tremblay, Clerk.

Howard Township, Ont.—Construction of drains and other improvements are considered by the township council. Geo. McDonald, Ridgeway, Ont., Clerk.

Smith's Falls, Ont.—See "Sewerage."

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Council Bluffs, Ia.—Board of supervisors for Mosquito Creek ditch contract, to *Sternberg Bros. and *E. A. Wickham for the "Skeeter" ditch.

Ottumwa, Ia.—City signed contract with the *Turner Improvement Co. of Des Moines for constructing east side dam. Will save the city \$1,500.

Lawrence, Mass.—For the supply of 5 tons of pig lead and 35 reels of lead pipe for use in the Water Dept. *Lenane Supply Co.; in each case \$8.25 and \$8.95. Bids received were: Pig lead, Riley Bros., \$8.35 per hundred; Richards & Co., Boston, \$8.48; Charles Miller, Boston, \$8.35. Thirty-five reels of lead pipe, Riley Bros., \$9.10; Millar, \$9.

Oscego, Mich.—*Traverse City Iron Works, Traverse City, Mich., secured contract let by city improving water works, \$16,580.

Pontiac, Mich.—The Marine Boiler Works of Toledo contract to furnish one Scotch boiler of 250 horsepower for \$6,000.

Mankato, Minn.—See "Sewerage."

Rahway, N. J.—Unanimous decision was made by board of water commissioners to sign a contract with the Elizabethtown Water Co. to supply the neighboring concern with whatever water it can reasonably spare from its present supply at the rate of \$50 per 1,000,000 gallons.

St. Marys, O.—City council awarded \$45,000 5 per cent. electric light and water works improvement bonds to *Cummings, Prudden & Co., Toledo, at par, accrued interest and \$2,601 premium.

Hamilton, Tex.—By city for water works system to *W. E. Henderson, Sweetwater, at \$31,400.

Collingwood, Ont.—To *Electro Bleaching Gas Co., New York, for a chlorination plant let by water and light committee.

Berkeley, Cal.—The city council is seriously considering the advisability of again advertising for bids for collecting city garbage. Council postponed final adoption of the amendment to the licensing ordinance providing for a fee of \$10 per month for every wagon used in the collection of garbage in the city.

Berkeley, Cal.—Councilman Robson asked for an appropriation of \$3,000 for the purchase of two light automobile trucks which will be used in connection with the replacing of street work after culverts and sewers have been laid. Council voted the necessary money.

Craig, Colo.—Election for \$40,000 Court House bonds carried. Miss L. O. Haughey, Clk. Co. Comrs.

Washington, D. C.—Bureau of Foreign and Domestic Commerce, Department of Commerce.—A man in Spain desires to purchase draftsmen's supplies, steel, brass thumb tacks, and double-pointed steel tacks. He would like to be furnished with catalogues of same. Prices should be quoted c. i. f. destination. Payment will be made in cash. Correspondence in Spanish.

Washington, D. C.—Bureau of Foreign and Domestic Commerce, Department of Commerce.—A firm in Cuba desires to represent American exporters, cement. Quotations should be made c. i. f. Cuban port or f. o. b. American port. Cash will be paid. Correspondence in English. References. Refer to opportunity No. 23286.

Washington, D. C.—Bureau of Foreign and Domestic Commerce, Department of Commerce.—A man in Spain would like to be placed in touch with American exporters of agricultural machinery and small automobile trucks and touring cars. Payment will be made against shipping documents. References. Correspondence may be in English. Refer to opportunity No. 23289.

Chicago, Ill.—City plan commission suggest that all the city's building waste, excavated earth, ashes and street sweepings be used in filling in the lake behind retaining walls or bulkheads in the development of the south shore lake front parks. In five years by using annual waste product of 3,069,861 cu. yds., 15,389,305 cu. yds. can be had. This will build the inner park lands. Of this material 1,500,000 cu. yds. per year or a total of 7,500,000 cu. yds. can be had from private contractors who will pay the city \$1,275,000 for the right of dumping their material on city land. Estimated value \$46,000,000. In seven years total of 21,489,027 cu. yds. can be had. This will build the outer park lands and the city can get a revenue of \$1,734,000 from dumping privileges. By these plans the entire park can be built in 12 years.

Gary, Ind.—Park board will ask city council to authorize Park bond to the amount of \$60,000.

New Albany, Ind.—City council adopted an ordinance providing for an appropriation of \$500 for the purchase of a conveyance for the use of the city traffic officer in the enforcement of the automobile speed law. It has not been determined whether a motorcycle or an automobile will be purchased.

South Bend, Ind.—Board of public safety to purchase combination patrol wagon. Bids are called for in January.

Attleboro, Mass.—Planning board recommends that the city purchase Study playground and a public comfort station be established at the center.

Haverhill, Mass.—Alderman Wood favors the purchase of a motor sprinkling cart for the city.

Melrose, Mass.—Improvements discussed some time to be undertaken at cost of \$11,000 removal of the remaining ice houses on Ell Pond and the development of the land for park purposes, and the cleaning of Spot Pond brook at \$12,000.

Springfield, Mass.—The much discussed garbage question will not be settled until after the first of the year, judging from present indications. In the meantime the farmers are collecting the refuse.

Hartford, Mich.—Village prison site bond issue carried.

Northville, Mich.—See "Sewerage."

Mankato, Minn.—City council voted to purchase from the Good Machinery Co., of Minneapolis, at \$53.40, new metal

street signs to be placed in box shape on the electric light poles on all of the corners from Vine to Marshall Sts.

Missoula, Mont.—City council accepted two blocks of land for public park, according to a design to be acquired by competition. Chamber of Commerce offers a prize of \$100 for the design accepted as the best by a board of judges. The city is taking steps to close a street that bisects the park site.

Chardon, Neb.—Ordinance passed by city council to issue city hall bonds to amount of \$15,000.

Brooklyn, N. Y.—Application for an appropriation for a new municipal bath house at Coney Island, made by Park Commissioner Raymond V. Laversoll of this city, is being considered by the corporate stock budget committee of the board of estimate.

Newburgh, N. Y.—The law committee was requested to draft a bill for introduction at the coming session of the legislature carrying an appropriation for barge canal terminals in cities on the Hudson River, whose applications have been approved by the superintendent of public works, and also to draft a bill securing an appropriation for lighting the Storm King highway.

Niagara Falls, N. Y.—Plans for bringing about the establishment of an international park on both sides of the Niagara River, taken up at a meeting of the Niagara State Reservation commission and prominent New York business men in New York will be considered at a meeting of the commission to be held early next year.

Plattsburg, N. Y.—First actual steps preparatory to the building of the Macdonough Memorial Park will be taken Dec. 15 when the building on the site purchased by the commission will be sold.

Rochester, N. Y.—The council authorized the issue of \$135,000 in city notes to pay for the plant of the Genesee Reduction Company, which has been appraised at \$127,414, and to pay for the expenses of the transfer and minor alterations to the plant. The garbage collection service and the reduction plant will be taken over by the Department of Public Works for operation by the city on January 1.

Schenectady, N. Y.—An ordinance was introduced and tabled to prevent the collection of garbage by any other than city collectors and to authorize the mayor to revoke his free permits to collect garbage. This was at the request of Commissioner of Public Works E. O. Hunt, who estimates that the city is losing more than \$10,000 a year through outside collections.

Syracuse, N. Y.—Grade crossing elimination to cost \$8,000,000. Blon J. Arnold, of Chicago, traction and terminal expert, to submit report in three weeks. He recommends a larger use of the Erie Canal bed, increasing the width for two tracks for electric interurban cars and bringing all such traffic to a union terminal at the present passenger station. Further advises D. L. & W. tracks to be elevated on ornamental concrete trestle.

Watertown, N. Y.—The magnificent city park proper, comprising 190 acres, has been offered to the city as a gift.

Yonkers, N. Y.—City sells \$316,000 bond issue to Larson Son and Co. at \$101.061.

Washington, N. C.—City will improve park and playground. John J. Blair of the Tree and Park Commission submitted specifications for planting trees at cost of \$235.70. J. F. Ganse presented a plan for improvement of Greenfield park. \$1,000 was provided for the expenditure in the last budget.

Cleveland, O.—Cuyahoga county receiving bids Jan. 6 for purchase of \$600,000 bonds.

Newcomerstown, O.—A disposal plant is considered by city.

Sandusky, O.—Proposals will be received by the purchasing agent of the city at the City Building for the disposal of garbage either by the reduction or by plowing it into the land.

Drumright, Okla.—See "Water Supply."

Dallas, Tex.—Four large municipal incinerators to cost between \$40,000 and \$50,000, for the consumption of all trash, garbage and refuse of the city, are proposed by Acting Mayor Otto H. Lang.

Beaumont, Tex.—Island Park approved as fair site. Committee recommended that the fair association petition the city council to call an election on the issuance of bonds in the sum of \$150,000 to build a levee around Island Park, or that portion of it to be improved, and to con-

struct a bridge across Brake's bayou and an auditorium.

Galveston, Tex.—Each member of the board of causeway engineers will be invited to submit a proposed plan for repairing the approach to the Galveston causeway on the island site, stated by Frank Merritt, chief engineer of the Gulf, Colorado & Santa Fe Railway and chairman of the causeway engineers. After each member who desires submits his own plan, or any other plan, the board of engineers will pick out what it considers the best idea and plans and specifications will be made accordingly. Plans have heretofore been considered for the approach repairs and a tentative estimate of \$140,000 for the work has been announced.

Refugio, Tex.—Election issuing \$15,000 Court House bonds carried.

Norfolk, Va.—Common council passed an ordinance appropriating \$391,000 to purchase property for sites for municipal docks.

Fairmont, W. Va.—Election for general improvement and refunding bonds carried, \$760,000.

Tacoma, Wash.—Work to begin soon on dredging the city waterway south from 11th St. bridge, the city has appropriated \$5,000, the government will spend approximately \$10,000. City Engineer Nicholson was assured recently by Col. J. B. Cavanaugh, United States Engineer in charge of this district, that the government would soon call for bids.

Niagara Falls, Ont.—Expenditure to be applied in connection with the proposed hydro-radial line from Welland to Bridgeburg, via Port Colborne and Fort Erie. The municipalities en route will vote on this measure. The cost has been apportioned as follows: Bridgeburg, \$90,422; Welland, \$168,900; Fort Erie, \$128,007; Humberstone, \$66,194; township of Bertie, \$782,666; township of Humberstone, \$689,755; and township of Crowland, \$203,449.

Windsor, Ont.—The city council has authorized the purchase of a motor feed crusher. City Engineer, M. E. Brian.

Winnipeg, Man.—Greater Winnipeg water district will call for tenders for the 1917 supply of cement. W. G. Chace, Chief Engr.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Bluffton, Ind.—Two ditches by County Surveyor T. C. Guldin for the Silas B. Slane ditch, in Union township, to *North-Frazier & Co., for \$1,782. The estimate \$1,783.38. *Luther Letts of Jay county, on the J. K. Hedges drain in Harrison township, \$2,250. The estimate \$2,300.57.

Boston, Mass.—Contract has been awarded by the Bay State St. Railway Co. for dredging the North River above the dam at the company's power house in Mason St., Salem, according to an agreement made when the dam was constructed. After this is done the city will clean the canal below the dam.

Duluth, Minn.—County Auditor Odin Halden let for the construction of County Ditch No. 7, a drainage project in the Meadowlands-Kelsey district. The main contract went to the *Northwestern Drainage Company of Grand Rapids, Wis., \$196,191.84. The *Minneapolis Steel & Machinery company to furnish culverts, \$8,483.60 and the *Wausau Iron company of Wausau, Wis., for installing bridges at \$7,076.

Mankato, Minn.—The contract for repairing of the sprinkling wagons and the street flusher was let to *Kuehne Bros. at \$110.

Newark, N. J.—Police board, for four new auto patrols to the *Stewart Garage Co. of 302 Washington St., at \$4,000.

Hudson, N. Y.—Police commission has contracted with *George Deming, of the

Du Bois Hardware Store, to furnish the town with ten iron policemen for \$7 each.

Gallipolis, O.—The government has let contract for a new lock and dam 25 miles from here in the Ohio River. The cost will be \$1,000,000.

Lima, O.—Work on the improvement of the Ottawa river will begin about January 15. John H. Jones of Fostoria, signed a contract to deepen and widen the stream from the Main street bridge to the first Erie bridge below the city. He will receive \$57,857.50 for the work. Calls for the removal of approximately 180,000 cubic yards of dirt and 2,000 cubic yards of rock.

Johnstown, Pa.—Council approved the bond of the Gamewell Fire Alarm Telegraph Co., which will install the police flashlight signal system.

Galveston, Tex.—Members of the board of causeway engineers received copies of the arbitrators' formal award in favor of the arch plan for permanent rehabilitation of the Galveston causeway. The communication, signed at New York, Dec. 4. Construction work expected to start shortly.

Quannah, Tex.—See "Sewerage."

Texarkana, Ark.—The Homan Drainage District bonds were sold to *Compton & Co., of St. Louis, for \$52,500. The total issue is for \$55,000 5 per cent. bonds, running 25 years. For building the Homan canal to *E. V. Olivet, of Indiana, will be commenced on the drainage about January 15th next. The canal will be 17 miles in length with about one mile of lateral. Will be 30 ft. wide at the top, and 15 ft. at the bottom and 9 ft. in length. Approximately 491,440 cu. yds. of earth will be excavated. The canal will begin at the lower Adams place.

Norfolk, Va.—Board of control to *Empire Machinery & Supply Corporation to furnish the street cleaning department with cart tire steel.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Ind.,	Cannelton	.....noon, Jan. 1.	Constructing macadam roads.....	M. C. Conway, Co. Audr.
SEWERAGE.				
Minn.,	St. Paul	.....10.30 a.m., Jan. 2.	Constructing sewer in Maryland Street.....	H. W. Austin, Purchasing Agt.
Ia.,	Garner	.....Jan. 5.	Drainage ditch, requiring 60,000 ft. 6 to 28-in. tile and 93,000 cu. yds. of excavation.....	E. P. Hanson, Co. Audr.
WATER SUPPLY.				
Mass.,	Boston	.....noon, Dec. 26.	Furnishing 5,500 %-in. and 1-in. water meters; furnishing 2,475 tons 4 to 16-in. c. i. pipe and 150 tons specials....	Patrick O'Hearn, Act. Supt. of Supplies.
Minn.,	St. Paul	.....10.30 a.m., Feb. 5.	Constructing high service reinforced concrete covered reservoir	H. W. Austin, Purchasing Agt.
MISCELLANEOUS.				
Ia.,	Sioux City	.....Dec. 23.	Motor truck, power flusher and horse-drawn flusher.....	Chas. Kloster, City Clerk.
Ind.,	Hammond	.....Dec. 27.	Constructing fire wall and altering pumping station.....	Jacob Schroeter, c/o Board of Public Works.
Miss.,	Senatobia	.....Dec. 28.	22 miles ditch construction, requiring 920,000 cu. yds. excavation	L. W. Washburn, Engr. Clarksdale, Miss.
N. Y.,	New York	.....11 a.m., Dec. 30.	Furnishing iron pedestals, columns, etc.....	Corp. Counsel, Room 2324.
Ind.,	Decatur	.....10 a.m., Dec. 30.	Constructing two drains.....	F. L. Macklin, Co. Audr.
Minn.,	St. Paul	.....10.30 a.m., Jan. 2.	Furnishing and connecting gas posts.....	H. W. Austin, Purchasing Agt.

STREETS AND ROADS

Berkeley, Cal.—It is understood that the Bd. of Supervisors will advertise for bids for the paving of a strip of 18 ft. in width on the west side of the thoroughfare from the city limits to the Contra Costa county line.

Jacksonville, Fla.—City Council will probably be asked to pass a bill authorizing the sale of \$250,000 street improvement bonds. If sold, more drains and sewers will be laid and considerable street paving will be done next year.

Corydon, Ind.—\$20,000 of Harrison County gravel road bonds were sold to the Farmers' Bank, Rockport, Ind., at

a premium of \$678. There are 40 bonds and they mature semi-annually, beginning May 16, 1918. The rate of interest is 4 per cent.

Brownstown, Ind.—The contract for construction of a macadam road in Carr Twp., Jackson County, will not be awarded on Jan. 1 as advertised. The road will be readvertised for later letting.

Laporte, Ind.—Indications are that some time next spring E St. from 10th St. north to 1st St. and Tyler from 1st to Lincolnway will be paved full width from curb to curb. Mayor and board are favorable to the improvement.

Louisville, Ky.—Ordinance to improve

a portion of the sidewalk on the north side of Kentucky St. between 4th St. and the first alley east of 4th St.

Louisville, Ky.—Ordinance to improve part of an alley from Dumesnil St. to Woodland Ave.

Cumberland, Md.—Paving Chase St. at \$75,000. A. W. Straub, City Clk., will soon ask for bids 3½ miles brick. Engr. Ralph Rifer.

Lowell, Mass.—Messrs. Blodget & Co., Boston, successful bidders for \$7,000 street widening bonds and \$50,000 pavement bonds.

Duluth, Minn.—Ordinance to appropriate \$1,522.29 for the repair of asphalt, bitulithic and tar macadam pavements in the city.